

# RICi-E3, RICi-T3

Fast Ethernet over E3/T3 Intelligent  
Converters

Version 1.0

**EtherAccess**



**data communications**

Innovative Access Solutions



# RICi-E3, RICi-T3

## Fast Ethernet over E3/T3 Intelligent Converters

Version 1.0

### Installation and Operation Manual

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To facilitate the reuse, recycling and other forms of recovery of waste equipment in protecting the environment, the owner of this RAD product is required to refrain from disposing of this product as unsorted municipal waste at the end of its life cycle. Upon termination of the unit's use, customers should provide for its collection for reuse, recycling or other form of environmentally conscientious disposal.

# General Safety Instructions

The following instructions serve as a general guide for the safe installation and operation of telecommunications products. Additional instructions, if applicable, are included inside the manual.

## Safety Symbols



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This symbol may appear on the equipment or in the text. It indicates potential safety hazards regarding product operation or maintenance to operator or service personnel.

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Danger of electric shock! Avoid any contact with the marked surface while the product is energized or connected to outdoor telecommunication lines.

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Protective earth: the marked lug or terminal should be connected to the building protective earth bus.

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Some products may be equipped with a laser diode. In such cases, a label with the laser class and other warnings as applicable will be attached near the optical transmitter. The laser warning symbol may be also attached.

Please observe the following precautions:

- Before turning on the equipment, make sure that the fiber optic cable is intact and is connected to the transmitter.
- Do not attempt to adjust the laser drive current.
- Do not use broken or unterminated fiber-optic cables/connectors or look straight at the laser beam.
- The use of optical devices with the equipment will increase eye hazard.
- Use of controls, adjustments or performing procedures other than those specified herein, may result in hazardous radiation exposure.

**ATTENTION:** The laser beam may be invisible!

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In some cases, the users may insert their own SFP laser transceivers into the product. Users are alerted that RAD cannot be held responsible for any damage that may result if non-compliant transceivers are used. In particular, users are warned to use only agency approved products that comply with the local laser safety regulations for Class 1 laser products.

Always observe standard safety precautions during installation, operation and maintenance of this product. Only qualified and authorized service personnel should carry out adjustment, maintenance or repairs to this product. No installation, adjustment, maintenance or repairs should be performed by either the operator or the user.

# Handling Energized Products

## General Safety Practices

Do not touch or tamper with the power supply when the power cord is connected. Line voltages may be present inside certain products even when the power switch (if installed) is in the OFF position or a fuse is blown. For DC-powered products, although the voltages levels are usually not hazardous, energy hazards may still exist.

Before working on equipment connected to power lines or telecommunication lines, remove jewelry or any other metallic object that may come into contact with energized parts.

Unless otherwise specified, all products are intended to be grounded during normal use. Grounding is provided by connecting the mains plug to a wall socket with a protective earth terminal. If an earth lug is provided on the product, it should be connected to the protective earth at all times, by a wire with a diameter of 18 AWG or wider. Rack-mounted equipment should be mounted only in earthed racks and cabinets.

Always make the ground connection first and disconnect it last. Do not connect telecommunication cables to ungrounded equipment. Make sure that all other cables are disconnected before disconnecting the ground.

## Connecting AC Mains

Make sure that the electrical installation complies with local codes.

Always connect the AC plug to a wall socket with a protective ground.

The maximum permissible current capability of the branch distribution circuit that supplies power to the product is 16A. The circuit breaker in the building installation should have high breaking capacity and must operate at short-circuit current exceeding 35A.

Always connect the power cord first to the equipment and then to the wall socket. If a power switch is provided in the equipment, set it to the OFF position. If the power cord cannot be readily disconnected in case of emergency, make sure that a readily accessible circuit breaker or emergency switch is installed in the building installation.

In cases when the power distribution system is IT type, the switch must disconnect both poles simultaneously.

## Connecting DC Power

Unless otherwise specified in the manual, the DC input to the equipment is floating in reference to the ground. Any single pole can be externally grounded.

Due to the high current capability of DC power systems, care should be taken when connecting the DC supply to avoid short-circuits and fire hazards.

DC units should be installed in a restricted access area, i.e. an area where access is authorized only to qualified service and maintenance personnel.

Make sure that the DC power supply is electrically isolated from any AC source and that the installation complies with the local codes.

The maximum permissible current capability of the branch distribution circuit that supplies power to the product is 16A. The circuit breaker in the building installation should have high breaking capacity and must operate at short-circuit current exceeding 35A.

Before connecting the DC supply wires, ensure that power is removed from the DC circuit. Locate the circuit breaker of the panel board that services the equipment and switch it to the OFF position. When connecting the DC supply wires, first connect the ground wire to the corresponding terminal, then the positive pole and last the negative pole. Switch the circuit breaker back to the ON position.

A readily accessible disconnect device that is suitably rated and approved should be incorporated in the building installation.

If the DC power supply is floating, the switch must disconnect both poles simultaneously.

## Connecting Data and Telecommunications Cables

Data and telecommunication interfaces are classified according to their safety status.

The following table lists the status of several standard interfaces. If the status of a given port differs from the standard one, a notice will be given in the manual.

Ports	Safety Status
V.11, V.28, V.35, V.36, RS-530, X.21, 10 BaseT, 100 BaseT, Unbalanced E1, E2, E3, STM, DS-2, DS-3, S-Interface ISDN, Analog voice E&M	SELV Safety Extra Low Voltage: Ports which do not present a safety hazard. Usually up to 30 VAC or 60 VDC.
xDSL (without feeding voltage), Balanced E1, T1, Sub E1/T1	TNV-1 Telecommunication Network Voltage-1: Ports whose normal operating voltage is within the limits of SELV, on which overvoltages from telecommunications networks are possible.
FXS (Foreign Exchange Subscriber)	TNV-2 Telecommunication Network Voltage-2: Ports whose normal operating voltage exceeds the limits of SELV (usually up to 120 VDC or telephone ringing voltages), on which overvoltages from telecommunication networks are not possible. These ports are not permitted to be directly connected to external telephone and data lines.
FXO (Foreign Exchange Office), xDSL (with feeding voltage), U-Interface ISDN	TNV-3 Telecommunication Network Voltage-3: Ports whose normal operating voltage exceeds the limits of SELV (usually up to 120 VDC or telephone ringing voltages), on which overvoltages from telecommunication networks are possible.

**Always connect a given port to a port of the same safety status. If in doubt, seek the assistance of a qualified safety engineer.**

Always make sure that the equipment is grounded before connecting telecommunication cables. Do not disconnect the ground connection before disconnecting all telecommunications cables.

Some SELV and non-SELV circuits use the same connectors. Use caution when connecting cables. Extra caution should be exercised during thunderstorms.

When using shielded or coaxial cables, verify that there is a good ground connection at both ends. The earthing and bonding of the ground connections should comply with the local codes.

The telecommunication wiring in the building may be damaged or present a fire hazard in case of contact between exposed external wires and the AC power lines. In order to reduce the risk,

there are restrictions on the diameter of wires in the telecom cables, between the equipment and the mating connectors.

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<b>Caution</b>	To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cords.
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<b>Attention</b>	Pour réduire les risques d'incendie, utiliser seulement des conducteurs de télécommunications 26 AWG ou de section supérieure.
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Some ports are suitable for connection to intra-building or non-exposed wiring or cabling only. In such cases, a notice will be given in the installation instructions.

Do not attempt to tamper with any carrier-provided equipment or connection hardware.

## Electromagnetic Compatibility (EMC)

The equipment is designed and approved to comply with the electromagnetic regulations of major regulatory bodies. The following instructions may enhance the performance of the equipment and will provide better protection against excessive emission and better immunity against disturbances.

A good earth connection is essential. When installing the equipment in a rack, make sure to remove all traces of paint from the mounting points. Use suitable lock-washers and torque. If an external grounding lug is provided, connect it to the earth bus using braided wire as short as possible.

The equipment is designed to comply with EMC requirements when connecting it with unshielded twisted pair (UTP) cables. However, the use of shielded wires is always recommended, especially for high-rate data. In some cases, when unshielded wires are used, ferrite cores should be installed on certain cables. In such cases, special instructions are provided in the manual.

Disconnect all wires which are not in permanent use, such as cables used for one-time configuration.

The compliance of the equipment with the regulations for conducted emission on the data lines is dependent on the cable quality. The emission is tested for UTP with 80 dB longitudinal conversion loss (LCL).

Unless otherwise specified or described in the manual, TNV-1 and TNV-3 ports provide secondary protection against surges on the data lines. Primary protectors should be provided in the building installation.

The equipment is designed to provide adequate protection against electro-static discharge (ESD). However, it is good working practice to use caution when connecting cables terminated with plastic connectors (without a grounded metal hood, such as flat cables) to sensitive data lines. Before connecting such cables, discharge yourself by touching earth ground or wear an ESD preventive wrist strap.



## FCC-15 User Information

This equipment has been tested and found to comply with the limits of the Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the Installation and Operation manual, may cause harmful interference to the radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## Canadian Emission Requirements

This Class A digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulation.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

## Warning per EN 55022 (CISPR-22)

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***Warning***

This is a class A product. In a domestic environment, this product may cause radio interference, in which case the user will be required to take adequate measures.

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***Avertissement***

Cet appareil est un appareil de Classe A. Dans un environnement résidentiel, cet appareil peut provoquer des brouillages radioélectriques. Dans ces cas, il peut être demandé à l'utilisateur de prendre les mesures appropriées.

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***Achtung***

Das vorliegende Gerät fällt unter die Funkstörgrenzwertklasse A. In Wohngebieten können beim Betrieb dieses Gerätes Rundfunkstörungen auftreten, für deren Behebung der Benutzer verantwortlich ist.

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# Quick Start Guide

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RICi-E3, RICi-T3 should be installed by an experienced technician. If you are familiar with RICi-E3, RICi-T3, use this quick guide to prepare RICi-E3, RICi-T3 for operation.

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## 1. Installing RICi-E3, RICi-T3

This section instructs you on connecting RICi-E3, RICi-T3 to the power and the network(s).

### Connecting the Interfaces

➤ To connect RICi-E3, RICi-T3 to the network:

1. Connect the network to the coax connector designated **E3** or **T3**.
2. Connect the user LAN to the RJ-45 connector designated **10/100 BaseT**.
3. Connect the ASCII terminal to the CONTROL connector at the rear panel.

OR

Connect a Telnet host, a PC running a Web browser or an SNMP management station to the Ethernet port.

### Connecting the Power

➤ To connect RICi-E3, RICi-T3 to the power:

- Connect the power cable to the power connector on the rear panel.

The unit starts running.

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## 2. Configuring RICI-E3, RICI-T3

Configure RICI-E3, RICI-T3 to the desired operation mode via an ASCII terminal connected to the rear panel CONTROL port. Alternatively, you can manage RICI-E3, RICI-T3 over Telnet, a PC running a Web browsing application, or SNMP via the Ethernet or E3 port.

---

**Note** *Remote management requires assigning an IP address.*

---

### Starting a Terminal Session

➤ **To start a terminal session:**

1. Connect an ASCII terminal to the CONTROL port at the front panel. The default settings are as follows:
  - **Baud Rate:** 115,200 bps
  - **Data Bits:** 8
  - **Parity:** None
  - **Stop Bits:** 1
  - **Flow Control:** None.
2. To optimize the view of the system menus, do the following:
  - Set the terminal emulator to **VT100**.
  - If you are using HyperTerminal, set the terminal mode to the 132-column mode.
3. Enter your user name and password and proceed with the management session.

---

**Note** *The RICI-E3, RICI-T3 default user name is **su** (lower case). The default password is **1234**.*

---

## Configuring Basic Parameters

The Quick Setup menu allows you to configure mandatory elements. For additional information on parameters and the menus, refer to [Chapter 4](#).

➤ **To configure RICi-E3, RICi-T3:**

1. Navigate to Main > Configuration > **Quick Setup**.
2. Configure the following parameters:
  - **Host IP Address**
  - **Host IP Mask**
  - **Default Gateway**
  - **Host Tagging** (untagged/tagged). If you select **Tagged**, additional parameters appear as follows:
    - **Host VLAN ID**
    - **Host VLAN Priority**
  - **Forwarding Mode** (transparent or filter)
  - **VLAN Tag Stacking** (enable/disable)
  - **E3/T3 Configuration**.



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# Chapter 1

## Introduction

### 1.1 Overview

RICi-E3, RICi-T3 is Ethernet customer-located equipment (CLE) and provides a demarcation point between the private LAN and the operator's network. RICi-E3, RICi-T3 serves as an Ethernet to E3/T3 media converter that bridges a Fast Ethernet LAN interface and an unframed E3 or framed T3 interface. RICi-E3, RICi-T3 features autonegotiation, fault management and flow control capabilities. The internal bridge supports VLAN tagging and priority labeling according to IEEE 802.1p. The unit can be managed via a local terminal port (out-of band) or any of the ports (inband). RICi-E3, RICi-T3 includes a DHCP client utility that automatically obtains an IP address, an IP mask and a default gateway.

This manual provides instructions on installing and operating RICi-E3 and RICi-T3 units. Screen images illustrate the workflow and usually apply to both RICi-E3 and RICi-T3. If a screen image only applies to RICi-E3 or RICi-T3, it carries the respective title.

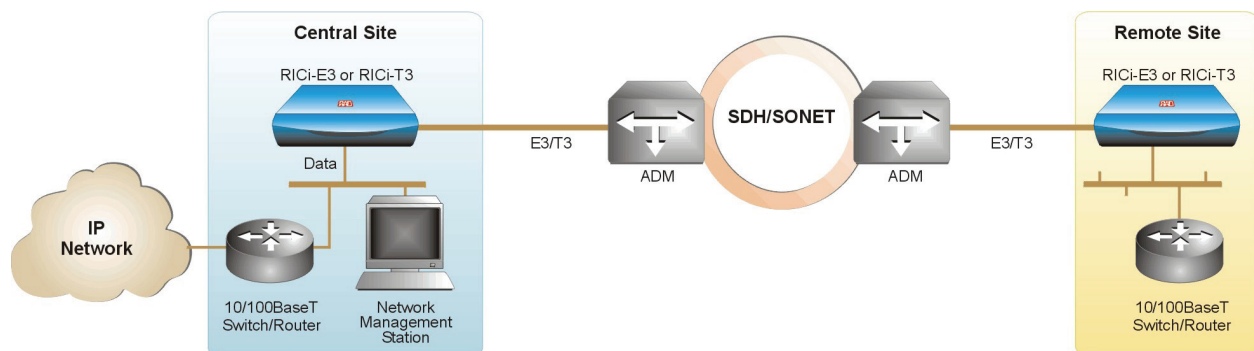
### Device Options

Device options include:

- **Interface types:** E3 or T3
- **Temperature-hardened option:** A temperature-hardened option is available, significantly extending the permitted operating temperature range.

### Application

*Figure 1-1* illustrates a typical application in which RICi-E3, RICi-T3 provides a demarcation point between the carrier's and the customer's networks.



*Figure 1-1. RICi-E3, RICi-T3 Typical Application*

## Features

RICi-E3, RICi-T3 offers the features specified below.

### Network Interface

The network interface terminates in an E3 or T3 coax network port.

### User Interface

The user interface terminates in a 10/100BaseT port, operating in half or full duplex mode. The 10/100BaseT user port supports auto negotiation.

### Fault Management

The unit provides a fault propagation mechanism. In cases of error conditions on the TDM port, a fault propagation feature tears down the link integrity on the Fast Ethernet port. This indicates the error conditions to the Ethernet network, enabling connected routers to reroute the traffic if required.

### Internal Bridge

The internal bridge of the unit operates in two modes:

- **Transparent** – no learning is performed, each received packet is forwarded to the other port. Filtering is performed on static MAC address entries.
- **Filter** – learning and filtering are enabled.

### Management

Setup, monitoring and tests can be performed using one of the following methods:

- **Out-of band management** – via an ASCII terminal connected to the V.24/RS-232 DTE control port.
- **Inband management** – via the Ethernet port, using Telnet, ConfiguRAD, or RADview-Lite (SNMP). RICi-E3, RICi-T3 allows up to five concurrent management sessions in addition to an ASCII terminal session.

### *ConfiguRAD*

ConfiguRAD is a user-friendly Web-based terminal management system enabling remote device configuration and maintenance. It is embedded in the unit and provided at no extra cost. ConfiguRAD can be run from any standard Web browser.

### *RADview-Lite*

RADview-Lite is a user-friendly and powerful SNMP-based element management application, used for planning, provisioning and managing heterogeneous networks. RADview-Lite provides monitoring capabilities for RAD products and networks via their SNMP agents. Configuration and diagnostic capabilities are available via a GUI-cut-through to ConfiguRAD.

### ***Inband Management***

For inband management, the IP host of RICi-E3, RICi-T3 can be configured to operate in tagged or untagged mode:

- When tagging is enabled, the IP host packets receive a VLAN tag, creating a dedicated management VLAN.

### **DHCP Client**

When the unit is starting up and if the DHCP client is enabled, the DHCP server automatically assigns an IP address, an IP mask and a default gateway to the unit.

### **Diagnostic Tools**

A built-in ping utility allows checking IP connectivity by pinging remote IP hosts.

The Trace Route application can quickly trace a route from RICi-E3, RICi-T3 to any other network device.

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## **1.2 Physical Description**

*Figure 1-2* illustrates a RICi-E3 and a RICi-T3 unit.



*Figure 1-2. RICi-E3, RICi-T3, 3D View*

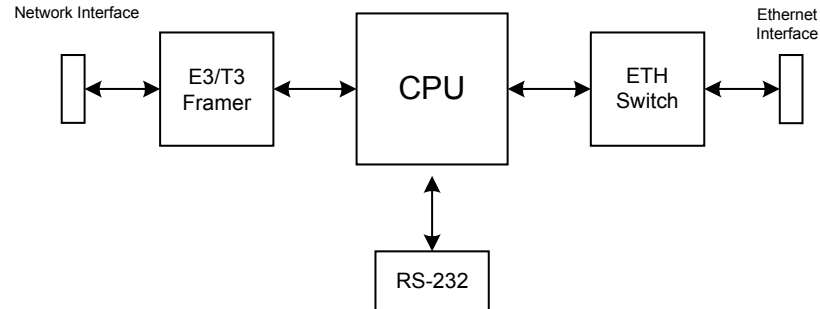
LEDs on the front panel display the status of power, Ethernet links, E3/T3 links and alarms. For a detailed description of the front panel, refer to [Chapter 3](#).

The rear panel is equipped with an AC power connector for AC and DC power supply, a V.24 terminal connector, network and user Ethernet ports. For a detailed description of the rear panel, refer to [Chapter 2](#).

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## 1.3 Functional Description

This section provides a functional description of RICi-E3, RICi-T3 by means of a block diagram (*Figure 1-3*).



*Figure 1-3. Block Diagram of RICi-E3, RICi-T3*

The RICi-E3, RICi-T3 media converter consists of the following major modules:

- **Power supply** – provides +5V, +3.3V voltage to the internal elements.
- **E3/T3 framer** – formats data for transmission and extracts data for reception at T3 and E3 line speeds.
- **CPU** – controls the RICi-E3, RICi-T3 operation.
- **Ethernet switch** – forwards packets between the Ethernet ports and the CPU.
- **User Ethernet interface** – connects RICi-E3, RICi-T3 to the user LAN.
- **Network E3/T3 interface** – connects RICi-E3, RICi-T3 to the E3/T3 network.
- **RS-232 port** – communicates with the ASCII terminal.

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## 1.4 Technical Specifications

### Network Interface

<b>E3</b>	<i>Interface type, connector</i>	Coax BNC
	<i>Compliance</i>	G.703
	<i>Framing</i>	Unframed
	<i>Data Rate</i>	34.368 Mbps
	<i>Line Code</i>	HDB3
	<i>Impedance</i>	75Ω, unbalanced
<b>T3</b>	<i>Interface type, connector</i>	Coax BNC
	<i>Compliance</i>	GR-499-CORE ANSI T1.107 ANSI T1.102
	<i>Framing</i>	C-bit parity, M23
	<i>Data Rate</i>	44.736 Mbps
	<i>Line Code</i>	B3ZS
	<i>Impedance</i>	75Ω, unbalanced
<b>User Interface</b>	<i>Type</i>	10/100BaseT
	<i>Interface type, connector</i>	Electrical, RJ-45
	<i>Operation Mode</i>	Full or half duplex, autonegotiation, flow control
	<i>Compliance</i>	IEEE 802.3, 802.3u
<b>Internal Bridge</b>	<i>Forwarding Mode</i>	Transparent or filter
<b>Management</b>	<i>Out-of-Band</i>	Via dedicated terminal port; V.24/RS-232 DCE; 9.6, 19.2, 115.2 kbps; DB-9 female connector
	<i>Inband</i>	Via either the Ethernet or E3/T3 port

<b>Front Panel Indicators</b>	<i>PWR (green)</i>	On – RICI-E3, RICI-T3 is on Off – RICI-E3, RICI-T3 is off
	<i>TST (yellow)</i>	On – test is in progress Off – no test is in progress Blinking (red/yellow) – alarm detected while test in progress
	<i>ALM (red)</i>	On – alarm has been detected Off – no alarm has been detected Blinking (red/yellow) – alarm detected while test in progress
	<i>LOS (red)</i>	On – network LOS (Loss of Signal) detected Off – network signal uninterrupted
	<i>LOS (yellow)</i> RICi-T3 only	On – Yellow alarm (RAI) has been detected Off – no Yellow alarm has been detected
	<i>ETH LINK (green)</i>	Ethernet Link Integrity: On – link is connected Off – link is disconnected
<b>Rear Panel Indicators</b>	<i>LINK (green)</i>	Ethernet Link Integrity: On – link is connected Off – link is disconnected
	<i>ACT (yellow)</i>	Ethernet Activity: Blinking – Frames are being received or sent Off – No frames are being received or sent
<b>Power</b>	<i>AC /DC Source</i>	100 to 240 VAC or 48/60 VDC (40 to 72 VDC)
	<i>Consumption</i>	8W
<b>Physical</b>	<i>Height</i>	43.7 mm (1.7 in)
	<i>Width</i>	220 mm (8.6 in)
	<i>Depth</i>	170 mm (6.7 in)
	<i>Weight</i>	0.5 kg (1.1 lb)
<b>Environment</b>	<i>Temperature</i>	RICi-E3, RICi-T3: 0 to 50°C (32 to 122°F) RICi-E3/H RICi-T3/H: -22° to 70°C (-7.6° to 158°F)
	<i>Humidity</i>	Up to 90%, non-condensing

# Chapter 2

---

## Installation and Setup

This chapter describes installation and setup procedures for the RICi-E3, RICi-T3 unit.

After installing the unit, refer to [Chapter 3](#) for the operating instructions.

If a problem is encountered, refer to [Chapter 6](#) for test and diagnostic instructions.



---

Internal settings, adjustment, maintenance, and repairs may be performed only by a skilled technician who is aware of the hazards involved.

Always observe standard safety precautions during installation, operation, and maintenance of this product.

---



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For your protection and to prevent possible damage to equipment when a fault condition, e.g., a lightning stroke or contact with high-voltage power lines, occurs on the cables connected to the equipment, RICi-E3, RICi-T3 must be properly grounded at any time. Any interruption of the protective (grounding) connection inside or outside the equipment, or the disconnection of the protective ground terminal can make this equipment dangerous. Intentional interruption is prohibited.

---

---

### 2.1 Site Requirements and Prerequisites

AC-powered RICi-E3, RICi-T3 units should be installed within 1.5m (5 ft) of an easily-accessible grounded AC outlet capable of furnishing the voltage in accordance with RICi-E3, RICi-T3 nominal supply voltage.

DC-powered RICi-E3, RICi-T3 units require a -48 VDC power source, which must be adequately isolated from the main supply.

**Note**

---

*Refer also to the sections describing connections of AC and DC mains at the beginning of the manual.*

---

Allow at least 90 cm (36 in) of frontal clearance for operating and maintenance accessibility. Allow at least 10 cm (4 in) clearance at the rear of the unit for signal lines and interface cables.

The ambient operating temperature of RICi-E3, RICi-T3 is 0 to 50°C (32 to 122°F), at a relative humidity of up to 90%, non-condensing. If you ordered the temperature-hardened version, the ambient operating temperature is -22° to 70°C (-7.6° to 158°F).

---

## 2.2 Package Contents

The RICI-E3, RICI-T3 package includes the following items:

- One RICI-E3 or RICI-T3 unit
- CBL-DB9F-DB9M-STR control port cable (if ordered)
- AC power cord
- DC adapter
- RM-33-2 rack mount kit (if ordered)

---

## 2.3 Mounting the Unit

RICI-E3, RICI-T3 is designed for installation as a desktop unit. You may also mount two units into a 19" rack or attach one unit to a wall.

- For rack mounting instructions, refer to the RM-33-2 installation kit manual.
- For wall mounting instructions, see the drilling template at the end of this manual.
- If RICI-E3, RICI-T3 is to be used as a desktop unit, place and secure the unit on a stable, non-movable surface.

Refer to the clearance and temperature requirements in [Site Requirements and Prerequisites](#).



---

## 2.4 Connecting the Interface Cables

*Figure 2-1* illustrates the rear panel of a typical RICi-T3 unit. The RICi-E3 unit is xsimilar, except for an E3 interface instead of the T3 interface. *Appendix A* specifies the RICi-E3, RICi-T3 connector pinouts.



*Figure 2-1. RICi-T3 Rear Panel*

- **To connect the Ethernet interface:**
  - Connect the user LAN to the RJ-45 connector designated **10/100 BaseT**.
- **To connect the E3 or T3 interface:**
  1. Connect the Rx cable to the BNC connector designated **Rx**.
  2. Connect the Tx cable to the BNC connector designated **Tx**.

---

## 2.5 Connecting to the ASCII Terminal

You may connect RICi-E3, RICi-T3 to an ASCII terminal using the 9-pin D-type female CONTROL connector at the rear panel. Refer to *Appendix A* for the connector pinout.

- **To connect the ASCII terminal to the CONTROL port:**
  1. Connect the male 9-pin D-type connector of the CBL-DB9F-DB9M-STR Control Port cable to the connector labeled **CONTROL**.
  2. Connect the other end of this cable to an ASCII terminal.

---

## 2.6 Connecting to Power

RICi-E3, RICi-T3 accepts either 110-240 VAC or -48/-60 VDC power through the same power inlet.



Before connecting or disconnecting any communication cable, the unit must be earthed by connecting its power cord to a power outlet with an earth terminal, and by connecting the earth terminal on the panel (if provided) to a protective ground.

Interrupting the protective (ground) conductor inside or outside the unit, or disconnecting the protective ground terminal may render this unit dangerous. Intentional interruption is prohibited.

---

### Connecting AC Power

AC power is supplied to the RICi-E3, RICi-T3 modem through a standard 3-prong socket, illustrated in [Figure 2-1](#).

AC power should be supplied via a 1.5m (5 ft) standard power cable terminated by a standard 3-prong socket. A cable is provided with the unit.

➤ **To connect AC power:**

1. Connect the power cable to the power connector on the RICi-E3, RICi-T3 rear panel.
2. Connect the power cable to the mains.

The unit automatically turns on once it has been connected.

### Connecting DC Power

A special IEC 60320 adapter for 48/60 VDC power is available for RICi-E3, RICi-T3.

➤ **To connect DC power:**

- Refer to the DC power supply connection supplement for instructions on wiring the DC adapter, and to the [Handling Energized Products](#) section.

# Chapter 3

---

## Operation

This chapter:

- Explains how to power RICI-E3, RICI-T3 on and off
- Provides a detailed description of the front panel controls and indicators and their functions
- Defines the default settings
- Provides the configuration alternatives
- Illustrates the management menus.

For additional information on parameters and menus, refer to [Chapter 4](#).

---

### 3.1 Turning On the Unit

► To turn on the unit:

- Connect the power cord to the mains.  
The PWR indicator lights up and remains lit as long as RICI-E3, RICI-T3 receives power.

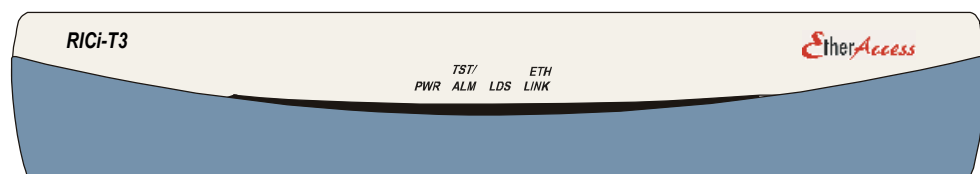
Once installed, RICI-E3, RICI-T3 does not require further attention with the exception of occasional monitoring of front panel indicators. RICI-E3, RICI-T3 only requires configuring the unit to comply with its operational requirements, or for testing.

---

### 3.2 Indicators

The unit's LEDs are located at the front panel as illustrated in [Figure 3-1](#).

[Table 3-1](#) lists the functions of the RICI-E3, RICI-T3 LED indicators.



*Figure 3-1. RICI-T3 Front Panel*

*Table 3-1. RICi-E3, RICi-T3 LEDs and Controls*

<b>Name</b>	<b>Color</b>	<b>Function</b>
PWR	Green	On – power connected Off – power disconnected
TST	Yellow	On – test in progress Off – no test in progress Blinking (red/yellow) – test in progress and alarm detected
ALM	Red	On – alarm detected Off – no alarm Blinking (red/yellow) – test in progress and alarm detected
LOS	Red	On – loss of signal detected, any T3 alarm except RAI Off – network signal detected
	Yellow	On – RAI alarm detected Applies to T3 units only
ETH LINK	Green	On – link connected Off – link disconnected

### 3.3 Default Settings

*Table 3-2* lists the default settings of the RICi-E3, RICi-T3 configuration parameters.

*Table 3-2. Default Settings*

Type	Parameter	Default Value
System		
	<i>Host</i>	
	IP address	0.0.0.0
	IP mask	255.255.255.0
	Default gateway	0.0.0.0
	Default IP	0.0.0.0
	DHCP	Disable
	Read community	Public
	Write community	Private
	Trap community	Public
	<i>Device Info</i>	
	Name	RICi-E3, RICi-T3
	Description	E3/T3 Intelligent Ethernet Converter
	Location	The Location of the Device
	Contact Person	Name of Contact Person
	<i>Management Access</i>	
	Telnet	Enable
	SNMP access	Enable
	Web access	Enable
	<i>User Access</i>	
	User name for superuser	su (full control)
	User name for guest user	user (read-only)
	<i>Encapsulation</i>	
	Host Tagging	Untagged
	Host VLAN ID	1
	Host VLAN Priority	0
	<i>Alarm Trap Mask</i>	
	Alarm ID	1
	Trap Status	Active
	<i>Control Port</i>	
	Baud Rate	115200 bps
	Set Scrolling Window Size	4
	Security Timeout	10

Type	Parameter	Default Value
Physical Ports <i>Ethernet User</i>		
	Administrative Status	Up
	Flow Control	Enable
<i>E3</i>  <i>T3</i>	Autonegotiation	Enable
	Max Capability Advertised	100base – TX Full Duplex
	MDIX Auto Cross Over	Enable
	Administrative Status	Up
	Clock	LBT
	Protocol	HDLC
	Administrative Status	Up
	Framing	M23
	Tx Clock	LBT
	Line Build Out	Up to 255 ft
	Protocol	HDLC
Bridge  <i>Bridge Port</i>		
	Forwarding Mode	Transparent
	Aging Time	300
	VLAN Tag Stacking	Disable
	Port VID/Stacking VID	2
	Copy Origin Priority	Disable
	Default Priority	0
QoS  <i>Rate Limitation</i> <i>Ingress</i>  <i>Egress</i>		
	User Priority 1-7	Traffic Class 0
	Rate Limitation	No Limit
	Burst Size	96
	Limit Packet Type	All
	Rate Limitation	No Limit

Type	Parameter	Default Value
Diagnostics		
	<i>Ping</i>	
	Destination IP Address	0.0.0.0
	Number of Frames to Send	1
	<i>Loopbacks</i>	
	MAC Swap	Disable
	Looped Data	All
<i>VLAN Test</i>	VLAN ID	1
	Direction	Local
	Forced Source Mac	00-00-00-00-00-00
	Forced Destination Mac	00-00-00-00-00-00
	Loopback Timeout	0
	Loopback State	Disable
	Port	Network 1
	VLAN ID	1
	State	Off

---

## 3.4 Configuration Alternatives

Configuration and monitoring operations are performed locally from an ASCII terminal connected to the control port or from a PC on the network via ConfiguRAD or RADview-Lite.

The following functions are supported by the RICi-E3, RICi-T3 management software:

- Viewing system information
- Modifying configuration and mode of operation, including setting system default values and resetting the unit
- Monitoring RICi-E3, RICi-T3 performance
- Initiating connectivity tests
- Upgrading software.

### Working via ASCII Terminal

RICi-E3, RICi-T3 includes a V.24/RS-232 asynchronous DCE port, designated CONTROL and terminated in a 9-pin D-type female connector. The CONTROL port continuously monitors the incoming data stream and immediately responds to any input string received through this port.

You may configure the RICi-E3, RICi-T3 control port to communicate at 9.6, 19.2, or 115.2 Kbps. To communicate with a PC, you have to set it to communicate at 115.2 Kbps.

➤ **To start a terminal control session:**

1. Make sure all RICi-E3, RICi-T3 cables and connectors are properly connected.
2. Connect RICi-E3, RICi-T3 to a PC equipped with an ASCII terminal emulation application such as HyperTerminal or Procomm.
3. Connect an ASCII terminal to the CONTROL port at the front panel. The default settings are as follows:
  - **Baud Rate:** 115,200 bps
  - **Data Bits:** 8
  - **Parity:** None
  - **Stop Bits:** 1
  - **Flow Control:** None.



4. To optimize the view of the system menus, do the following:
  - Set the terminal emulator to VT100.
  - If you are using HyperTerminal, set the terminal mode to the 132-column mode.
5. Power up RICI-E3, RICI-T3.

When the unit has initialized and completed the self-test, a menu appears displaying initialization and self-test results.

## Logging In

### ► To log in:

1. Enter the default user name **su** for superuser.
2. Enter the default password **1234**.

- 
- Note**
- *It is recommended to change default passwords to prevent unauthorized access to the unit.*
  - *If you do not enter at least one character within 5 minutes, you will have to log in again.*
- 

## Selecting Options

### ► To select an option:

1. Type the number corresponding to the option and press **<Enter>**.
2. If you performed a change, **Save** appears as the last option in the menu.
3. Type the number corresponding to the **Save** option in the current menu, and press **<Enter>** to save your change.

RICi-E3, RICI-T3 updates its database with the new value or displays a new menu for the selected option.

4. If you press **<ESC>** to exit the menu without saving your changes, the following message appears:

"Do you want to save changes (Y/N/C)?"

Type the appropriate letter, **Yes**, **No**, or **Cancel**.

- 
- Note**
- When a menu option has only two values, typing the option number and pressing **<Enter>** will toggle between the available values.*
-

## Navigating Tables

Some RICi-E3, RICi-T3 management screens, such as the Inventory table and Manager table exceed the screen height and/or width and require scrolling to navigate between parameters.

To navigate a table, use the keys listed below:

- <Ctrl>+L – scroll left, **Left Arrow** – move left,
- <Ctrl>+R – scroll right, **Right Arrow** – move right
- **Up Arrow** – move up
- **Down Arrow** – move down
- <Tab> – select next changeable cell
- G<row number>, <col number> - navigate to the specified cell.

---

**Note**

- *You can display these navigation keys by pressing <?> from a table.*
  - *The navigation keys are case sensitive.*
-

## Working with ConfiguRAD

ConfiguRAD is a Web-based remote access terminal management software. It provides a user-friendly interface for configuring, collecting statistics and performing tests.

### Requirements for Web Based Management

- Internet Explorer 6.0 and up, running on Windows™
  - Netscape Communicator 7.0 and up, running on Windows™, HPOV or Linux
  - Firefox 1.0.4 and up, running on Windows™
  - Mozilla 1.4.3 and up, running on Linux.
- **Before you start using a Web browser for remote management or monitoring:**
- Enable scripts.
  - Configure the firewall that might be installed on your PC to allow access to the destination IP address.
  - Disable pop-up blocking software, such as Google Popup Blocker. You may also have to configure spyware and adware protecting software to accept traffic from/to the destination IP address.
  - To prevent configuration errors, you must flush the browser's cache whenever you return to the same screen.

## Logging In

### ► To log in from a Web browser:

1. Connect the Ethernet port to the LAN.
2. Verify that an IP address has been assigned to the relevant unit, using an ASCII terminal.
3. Open the Web browser.
4. Disable any pop-up blocking software, such as Google Popup Blocker.
5. In the address field, enter the IP address of RICi-E3, RICi-T3 and then press <Enter>. The address line reads something like **http://172.16.100.253**.

The Opening window appears.

6. Click **LOGIN**; you are asked for the user name and the password.
7. Enter your user name and the password. The default user name for read/write permission is **su** and the default password is **1234**.

The ConfiguRAD Main menu appears.

### Notes

- *It is recommended to change default passwords to prevent unauthorized access to the unit.*
- *RICi-E3, RICi-T3 allows two management sessions to be active simultaneously: one network session (Telnet, ConfiguRAD, RADview-Lite) and one ASCII terminal session.*
- *If no user input is detected for 5 minutes during a ConfiguRAD session, RICi-E3, RICi-T3 automatically disconnects from the management station.*

## Navigating the ConfiguRAD Menus

ConfiguRAD is a Web-based remote access terminal management software. It provides a user-friendly interface for configuring, collecting statistics and performing diagnostic tests on the RICi-E3, RICi-T3 units. Menus and available options are identical to the ones available using Telnet or an ASCII terminal.

At the left-hand bottom corner, ConfiguRAD are the auxiliary management tools:

- **Status.** Shows the number of users currently managing RICi-E3, RICi-T3
- **Trace.** Opens an additional pane for system messages, progress indicators such as ping, software and configuration file downloads, and alarms. It is recommended to keep the trace pane open all the time.
- **Refresh All.** Refreshes performance registers.

### ► To choose an option:

1. Click a link in the ConfiguRAD screen to display the next menu.
2. Once the target screen appears, select a value from the drop-down list or enter it in into a text field.

## Working with RADview-Lite

RADview-Lite is a user-friendly and powerful SNMP-based element management system (EMS), used for planning, provisioning and managing heterogeneous networks. RADview-Lite provides monitoring capabilities for RAD products and networks using their built-in SNMP agents.

Configuration and diagnostic capabilities are available via a GUI-cut-through to ConfiguRAD.

For additional information on RADview-Lite, contact your local distributor.

## 3.5 Menu Map

Use the menu map as a reference while monitoring and configuring your unit.  
[Chapter 4](#) illustrates the menus and explains the associated parameters.

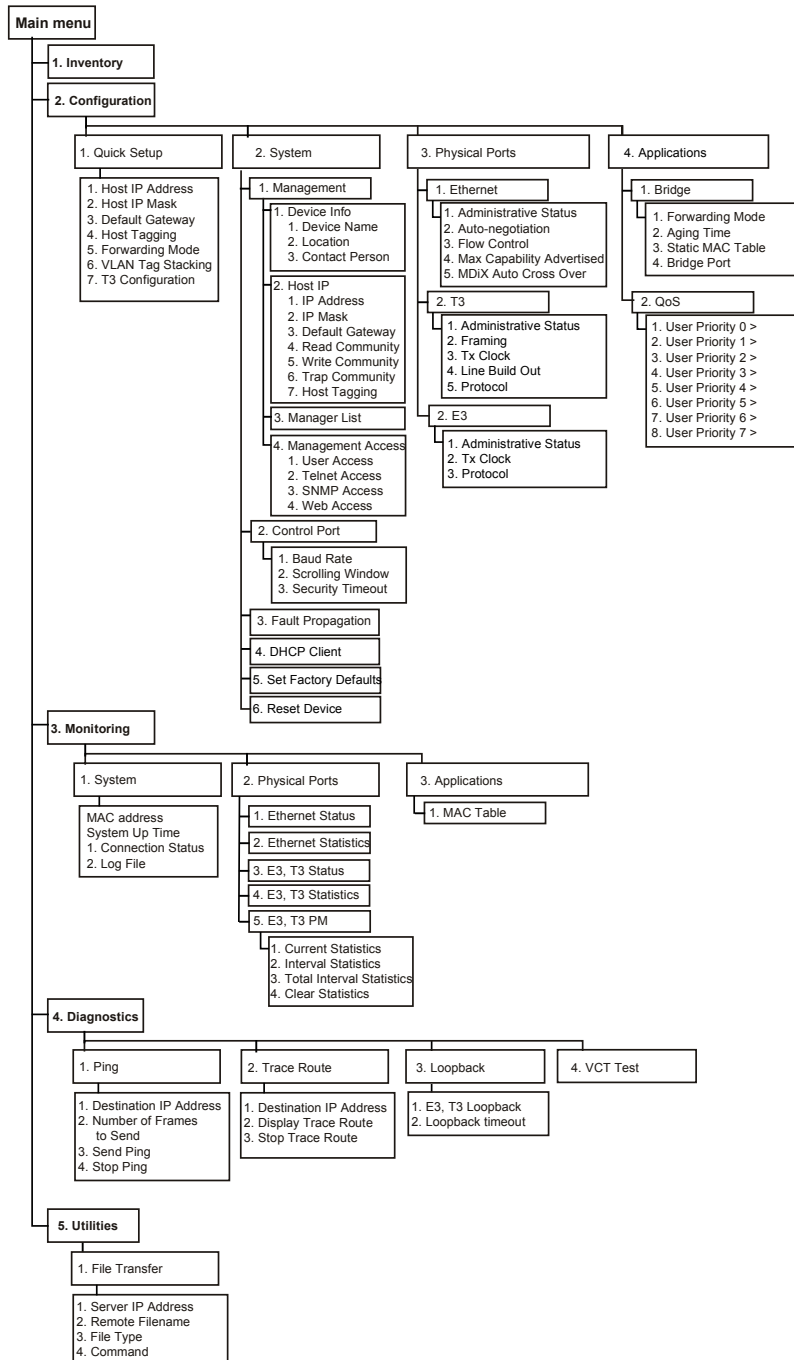


Figure 3-2. Menu Map

---

## 3.6 Turning Off the Unit

- To power off the unit:
  - Remove the power cord from the power source.





# Chapter 4

---

## Configuration

This chapter illustrates the RICi-E3, RICi-T3 configuration screens and explains their parameters.

For quick reference, a menu tree of the RICi-E3, RICi-T3 management software is available in [Chapter 3](#).

The remaining sections in this chapter explain the parameters available via the respective options in the Main menu.

For convenience, parameters that are mandatory for configuration, such as IP parameters of the RICi-E3, RICi-T3 host or forwarding mode, are provided in the Quick Setup menu (**Main menu > Configuration > Quick Setup**). For information on this menu, refer to the Quick Start Guide at the beginning of this manual. For additional information on the associate parameters, refer to the relevant sections in the configuration chapter.

---

**Note**

*Menus are illustrated for both RICi-E3 and RICi-T3. The menus are the same unless specified otherwise*

---

---

### 4.1 Configuring for Management

For first use, you have to configure management parameters via an ASCII terminal connected to the CONTROL port. Once the host IP parameters are set, you may access RICi-E3, RICi-T3 via ConfiguRAD or RADview to continue configuring for operation. To configure RICi-E3, RICi-T3 for management, do the following:

- Configuring IP Host Parameters
- Entering Device Information
- Configuring Communities
- Configuring the Host Encapsulation
- Configuring the Network Managers
- Controlling the Management Access

## Configuring IP Host Parameters

You may manage RICi-E3, RICi-T3 using a network management station on the LAN that is connected to RICi-E3, RICi-T3. In order to establish a proper connection, you have to configure the host IP address, the subnet mask and the default gateway. It is also possible to automatically receive these host IP parameters via the DHCP client when starting the unit.

### Configuring the DHCP Client

RICi-E3, RICi-T3 maintains a DHCP client that requests an IP address from a DHCP server, when the unit is connected to the network. The DHCP client can be enabled or disabled. RICi-E3, RICi-T3 ships with the DHCP disabled by default.

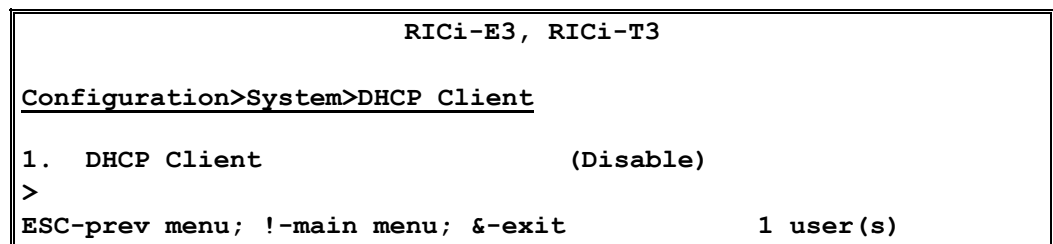
#### Note

*You have to configure the DHCP client via an ASCII terminal or an SNMP manager such as RADview. This option is masked for Telnet and ConfiguRAD sessions.*

#### ➤ To enable the DHCP client:

1. Navigate to Main Menu > Configuration > System > **DHCP Client**.

The DHCP Client menu appears as illustrated in [Figure 4-1](#).



*Figure 4-1. DHCP Client Menu*

2. From the DHCP Client menu, select **DHCP Client** and choose **Enable**.

RICi-E3, RICi-T3 receives all required host IP parameters once the DHCP server has been identified.

#### Note

*You have to log on again once the unit has been reset.*

#### ➤ To disable the DHCP client:

- From the DHCP Client menu, select **DHCP Client** and choose **Disable**.

RICi-E3, RICi-T3 releases the current IP address and then resets. You have to manually reconfigure the host IP parameters as explained under [Managing IP Parameters](#).

## Managing IP Parameters

► To define host IP parameters manually:

1. Navigate to Main Menu > Configuration > System > Management > **Host IP**.

The Host IP menu appears as illustrated in *Figure 4-2*.

```

RICi-E3, RICi-T3

Configuration>System> Management >Host IP

1. IP Address                ... (0.0.0.0)
2. IP Mask                   ... (255.255.255.0)
3. Default gateway          ... (0.0.0.0)
4. Read community           ... (public)
5. Write community          ... (private)
6. Trap community           ... (public)
7. Host Tagging              ... (untagged)

>

ESC-prev menu; !-main menu; &-exit;          1 user(s)

```

*Figure 4-2. Host IP Menu*

2. From the Host IP menu, perform the following:
  - Select **Host IP List** to define the IP address of the SNMP host.
  - Select **IP Mask** to define the host IP subnet mask.
  - Select **Default Gateway** to set the default gateway IP address.
3. Select **Save**.

---

**Note**     *The default gateway must belong to the same subnet as the host.*

---

## Entering Device Information

The RICi-E3, RICi-T3 management software allows you to assign a name to the unit, specify its location to distinguish it from the other devices installed in your system, and assign a contact person.

► **To enter device information:**

1. Navigate to Main Menu > System > Management > **Device Info.**

The Device Information menu appears as illustrated in *Figure 4-3*.

2. From the Device Info menu, select **Device Name** and enter a desired name for the RICi-E3, RICi-T3 unit.
3. Select **Device Location** and enter the desired name for the current RICi-E3, RICi-T3 location.
4. Select **Contact Person** and enter name of a contact person.
5. Select **Save**.

RICi-T3	
<u>Configuration&gt;System&gt;Management&gt;Device Information</u>	
Description	(T3 Intelligent Ethernet Converter)
1. Device Name	... (RICi-T3)
2. Location	... (The Location of the Device)
3. Contact Person	... (Name of Contact Person)
>	
ESC-prev menu; !-main menu; &-exit;	
1 user(s)	

*Figure 4-3. Device Information Menu*

## Configuring Communities

In order to establish a proper management link, you have to specify the SNMP trap, read and write communities.

► **To configure communities:**

1. Navigate to Main Menu > Configuration > System > Management > **Host IP.**

The Host IP menu appears as illustrated in *Figure 4-2*.

2. From the Host IP menu, do the following:
  - Select **Read Community** to enter the name of a community with read-only authorization.
  - Select **Write Community** to enter the name of a community with write authorization.
  - Select **Trap Community** to enter the name of a community to which RICi-E3, RICi-T3 sends traps.

## Configuring the Host Encapsulation

The RICi-E3, RICi-T3 management software allows you to separate traffic. You can choose to allow packets to be received by the network port, the user port, by both or none of them. To separate traffic, you have to tag the VLAN packets and specify the VLAN ID, the priority and ports to be open to the relevant packets.

➤ **To configure the host encapsulation:**

1. Navigate to Main Menu > Configuration > System > Management > **Host IP**.

The Host IP menu appears as illustrated in *Figure 4-2*.

2. Select **Host Tagging** to enable or disable VLAN tagging performed by the host as follows:

- **Untagged.** The IP host operates like a regular bridge with the network and user interfaces acting as bridge ports. Any packet, including VLAN-tagged, can be forwarded to the user Ethernet port.
- **Tagged.** When the IP host packets are sent with a VLAN tag, they are forwarded to and received via the device ports, creating a dedicated management VLAN. All packets with the management VLAN tag received at the user Ethernet port are discarded.

If you select **Tagged**, three additional parameters appear as illustrated in *Figure 4-4*:

- **VLAN ID.** Specify a value between 1 and 4094.
- **VLAN Priority.** Specify the priority level for the host VLAN (0–7).
- **Physical Ports Access.** Specify which port(s) can receive the IP host packets. The following options are possible:
  - All
  - Network Port Only
  - User Port Only
  - None

3. Select **Save**.

```

RICi-E3, RICi-T3

Configuration>System> Management >Host IP

1. IP Address ... (0.0.0.0)
2. IP Mask ... (255.255.255.0)
3. Default gateway ... (0.0.0.0)
4. Read community ... (public)
5. Write community ... (private)
6. Trap community ... (public)
7. Host Tagging ... (Tagged)
8. Host VLAN ID [1-4094] ... (1)
9. Host VLAN priority [0-7] ... (0)
10. Physical Ports Access ... (Network port only)

>
ESC-prev menu; !-main menu; &-exit; 1 user(s)

```

Figure 4-4. Host IP Menu (Host Tagging selected)

## Configuring the Network Managers

Define or modify the network managers to which the SNMP agent of RICi-E3, RICi-T3 sends traps. Up to ten network managers can be defined. Entering the IP address and corresponding subnet mask defines each manager. In addition, you can temporarily prevent a network manager from receiving traps by masking the network manager. Before editing the manager list, it is necessary to add at least one network manager.

### ► To add a network manager:

1. From the Management menu, select **Manager List**.

The Manager List menu appears as illustrated in [Figure 4-5](#).

```

RICi-E3, RICi-T3

Configuration>System>Management>Manager List

Manager ID   Manager IP   Manager IP Mask   Manager Trap Mask
1.           1.1.1.1     255.255.255.0     Disable
2.           2.2.2.2     255.255.255.0     Disable
3.           3.3.3.3     255.255.255.0     Disable
4.           4.4.4.4     255.255.255.0     Disable

1. Change cell ... (1.1.1.1)
>
x - Clear Table
ESC-prev menu; !-main menu; &-exit; ?-help 1 user(s)

```

Figure 4-5. Manager List Menu

2. In the Manager List menu, press <A> to add a manager.

The Manager List menu switches to the Add mode as illustrated in [Figure 4-6](#).

```

RICi-E3, RICi-T3
Configuration>System>Management>Manager List
1. Manager ID (1)
2. Manager IP ... (1.1.1.1)
3. Manager IP Mask ... (255.255.255.0)
4. Manager Trap Mask ... (Disable)
5. Save all

>

ESC-prev menu; !-main menu; &-exit; 1 user(s)

```

Figure 4-6. Manager List Menu, Add Mode

3. When in Add mode, do the following:
    - Select **Manager IP**, and enter the IP address of the management station.
    - Select **Manager IP Mask**, and enter the subnet mask of the management station.
    - Select **Manager Trap Mask**, and select **Enable** or **Disable** to mask or unmask traps for the selected management station.
    - Select **Save all** to save the network manager.
    - Press <Esc> to return to the Edit mode.
- **To edit the manager list:**
1. In the Management List menu, move the cursor to the Manager IP cell by pressing <Tab>. The selected cell is highlighted and the value displayed in the "Change cell" field.
  2. Press <1>, and then press <Enter> to enter a new IP address for the selected network manager.
  3. Move the cursor to the Manager IP Mask cell, and change or enter a new subnet mask value as required.
  4. Move the cursor to the Trap Mask field and toggle between **Enable** and **Disable** to mask or unmask traps for the selected network manager.
- **To remove a network manager:**
1. From the Manager List, select the desired network manager.
  2. Press <R> to remove the selected network manager.
- **To remove all network managers:**
- Press <X> to remove all network managers from the Manager list.

## Controlling the Management Access

You can enable or disable access to the RICi-E3, RICi-T3 management system via SNMP, Telnet or Web-based applications. By disabling SNMP, Telnet or Web, you prevent unauthorized access to the system when security of the RICi-E3, RICi-T3 IP address has been compromised. When SNMP, Telnet and Web access are disabled, you can only manage RICi-E3, RICi-T3 via an ASCII terminal connected to the Control port.

➤ To define the management access method:

1. From the Management menu, select **Management Access**.

The Management Access menu appears as illustrated in *Figure 4-7*.

```

RICi-E3, RICi-T3
Configuration>System>Management>Management Access
1. User Access >
2. TELNET access > (Enable)
3. SNMP access > (Enable)
4. WEB access > (Enable)

>
ESC-prev menu; !-main menu; &-exit 1 user(s)

```

*Figure 4-7. Management Access Menu*

**Note**

- During a Telnet session, Telnet Access is masked.
- During a SNMP session, SNMP Access is masked.
- During a Web session, Web Access is masked.

2. From the Management Access menu, select **TELNET access** to configure Telnet access, select **SNMP access** to configure SNMP access, or select **WEB access** to configure Web access.
3. Select **Save**.



## Configuring Control Port Parameters

RICi-E3, RICi-T3 embedded software enables you to configure the serial port parameters, which include specifying terminal baud rate, and scrolling window size.

The user-configurable size of the scrolling window specifies the height of the area that is reserved for status information. This area is located at the bottom of the screen.

The security timeout specifies a time interval after which RICi-E3, RICi-T3 automatically disconnects from the supervisory terminal if no input from the user is detected. You may set the timeout to up to 60 seconds or disable it.

---

**Note**

- *The Baud Rate parameter is masked during Telnet and ConfiguRAD management sessions.*
  - *For Telnet or ConfiguRAD management, the security timeout is set to 10 minutes and cannot be modified.*
-

► To modify the control port parameters:

1. Navigate to Main Menu > Configuration > System > **Control Port**.

The Control Port menu appears as illustrated in *Figure 4-8*.

```

                                RICi-E3, RICi-T3
Configuration>System>Control Port
  Terminal Type                      (VT100)
2. Baud Rate                        (115200 bps)
3. Set Scrolling Window Size[0 - 11]  (4)
3. Security Timeout (min) [0 - 60]    (10)

>
ESC-prev menu; !-main menu; &-exit                                1 user(s)

```

*Figure 4-8. Control Port Menu*

2. From the Control Port menu, select **Baud Rate**.
3. Type in the desired baud rate. Available baud rates are 9600, 19200, and 115200 bps.
4. Select **Set Scrolling Window Size** to set the size of the status information section at the bottom of the screen in the range of **0** to **11**.
5. Select **Security Timeout** to disable it (0) or set to in the range of 10 to 60 seconds.
6. Select **Save**.

---

## 4.2 Configuring for Operation

Configuring RICi-E3, RICi-T3 includes the following steps:

- Configuring network and user interfaces at the physical layer
- Configuring the internal bridge
- Configuring QoS parameters.

### Configuring Interfaces on the Physical Layer

RICi-E3, RICi-T3 includes one network E3 or T3 port and one user Ethernet port. The Ethernet and E3 or T3 configuration menus can be accessed from the Physical Ports menu. In addition, you are able to configure fault propagation.

#### Configuring Fault Propagation

RICi-E3, RICi-T3 supports fault propagation. When fault propagation is enabled:

- 'Port down' status on the WAN network port (E3 or T3) will lead to 'port down' status on the User port (Ethernet).
- 'Port down' status on the User port (Ethernet) will not cause 'port down' status on the network port.

➤ **To enable or disable fault propagation:**

1. Navigate to Main Menu > Configuration > System > **Fault Propagation**.

The selected value toggles between **Enabled** and **Disabled**.

2. Select **Save**.

#### Configuring the Ethernet Port

RICi-E3, RICi-T3 includes an Ethernet port. You can configure its parameters at the physical level as follows:

- Autonegotiation
- Data rate and duplex mode, (only when autonegotiation is disabled)
- Maximum advertised capability for autonegotiation procedure
- Flow control.

► To configure the Ethernet port:

1. From the Physical Ports menu, select **Ethernet**.

The Ethernet menu appears as illustrated in *Figure 4-9*.

```

                                RICi-E3, RICi-T3

Configuration > Physical Ports > Ethernet

1. Administrative Status          (Up)
2. Auto-Negotiation              (Enable)
3. Flow Control                  (Enable)
4. Max Capability Advertised      (100base - TX Full Duplex)
5. MDIX Auto cross over          (Enable)

>
ESC-prev menu; !-main menu; &-exit          1 user(s)

```

*Figure 4-9. Ethernet Menu*

2. In the Ethernet menu, configure the following:
  - **Administrative Status**
    - **Up** – the network port is enabled
    - **Down** – the network port is disabled.
  - **Autonegotiation**
    - **Enable** – autonegotiation is enabled
    - **Disable** – autonegotiation is disabled
  - **Flow Control**
    - **Enable** – flow control is enabled
    - **Disable** – flow control is disabled.
  - **Max Capability Advertised.** The highest traffic handling capability to be advertised during the autonegotiation process
    - **10baseT Half Duplex**
    - **10baseT Full Duplex**
    - **100baseTX Half Duplex**
    - **100baseTX Full Duplex.**
  - **MDIX Auto cross over**
    - **Enable** – MDIX Auto cross over is enabled
    - **Disable** – MDIX Auto cross over is disabled.
3. Select **Save** to complete the network Ethernet port configuration.

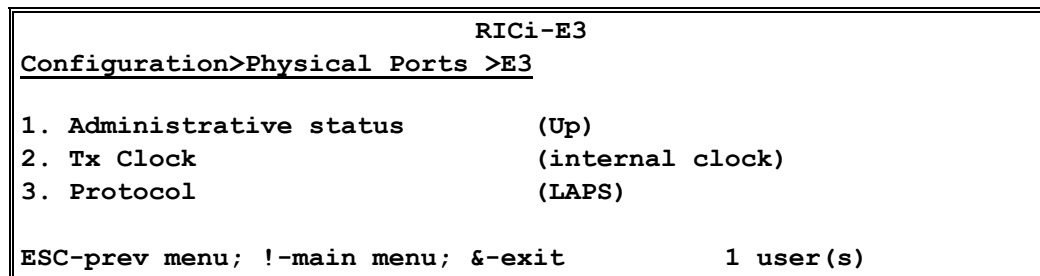
## Configuring the E3 Port

RICi-E3 includes an E3 port. You can configure its parameters at the physical level as follows:

➤ **To configure the E3 port:**

1. From the Physical Ports menu, select **E3**.

The E3 menu appears as illustrated in *Figure 4-10*.



*Figure 4-10. E3 Menu*

2. From the E3 menu, configure the following:
  - **Administrative Status**
    - **Up** – the network port is enabled
    - **Down** – the network port is disabled.
  - **Tx Clock**. Specifies the clock source
    - **Internal**
    - **LBT**.
  - **Protocol**. Specifies the encapsulation
    - **HDLC**
    - **LAPS**.
3. Select **Save** to complete the user E3 port configuration.

## Configuring the T3 Port

RICi-T3 includes a T3 port. You can configure its parameters at the physical level as follows:

➤ **To configure the T3 port:**

1. From the Physical Ports menu, select **T3**.

The T3 menu appears as illustrated in *Figure 4-11*.

RICi-T3	
<b>Configuration &gt; Physical Ports &gt; T3</b>	
1. Administrative Status	(Up)
2. Framing	(M23)
3. Tx Clock	(LBT)
4. Line Build Out	(Up to 225ft)
5. Protocol	(LAPS)
ESC-prev menu; !-main menu; &-exit	
1 user(s)	

*Figure 4-11. T3 Menu*

2. From the T3 menu, configure the following:
  - **Administrative Status**
    - **Up** – the network port is enabled
    - **Down** – the network port is disabled.
  - **Framing**. Specifies the framing type
    - **M23**
    - **C-bit**.
  - **Tx Clock**. Specifies the clock
    - **Internal Clock**
    - **LBT**.
  - **Line Build Out** for Line Mode = DSU. The length of a cable in feet between T3 port connector and the network access point
    - **Up to 225 feet** – 0 to 225 ft
    - **Over 225 feet** – 225 ft and further.
  - **Protocol**. Specifies the encapsulation
    - **HDLC**
    - **LAPS**.
3. Select **Save** to complete the user T3 port configuration.

The selected value shows in the T3 Port configuration menu.

## Configuring the Bridge

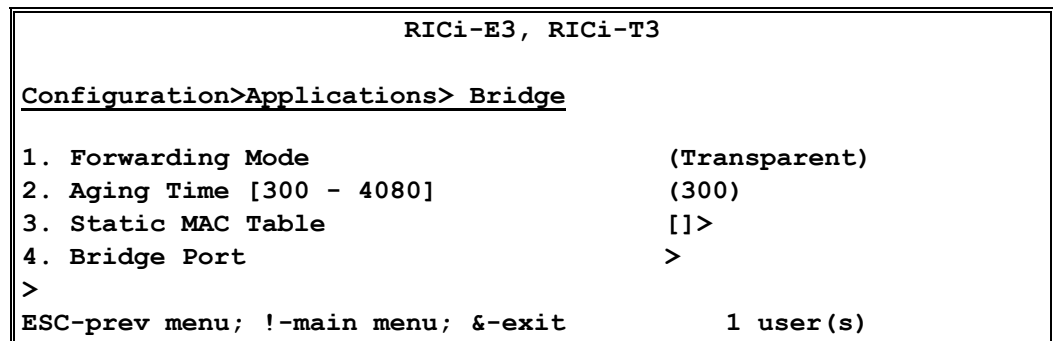
The internal bridge of RICi-E3, RICi-T3 connects the ports of the unit. It must be configured to properly process the VLAN tags to maintain priority of the data flow.

The bridge operates in Transparent mode (learning and filtering are disabled) or Filtered mode (learning and filtering are enabled).

► **To configure the internal bridge:**

1. Navigate to Main Menu > Configuration > Applications > **Bridge**.

The Bridge menu appears as illustrated in *Figure 4-12*.



*Figure 4-12. Bridge Menu*

2. From the Bridge menu, configure the following:
  - **Forwarding Mode** (operation mode of the internal bridge):
    - **Transparent** – No learning or filtering is performed. Each received packet is automatically forwarded to the other port (user or network).
    - **Filtering** – Learning and filtering are enabled.
  - **Aging Time** (amount of time a LAN node (station) is allowed to remain inactive before it is removed from the network):  
Enter the time between **300** to **4080** seconds.

## Configuring the MAC Table

Static MAC addresses are stored in the MAC table.

► **To add a static MAC address:**

1. From the Bridge menu, select **Static MAC Table**.

The Static MAC Table appears as illustrated in *Figure 4-13*.

RICi-E3, RICi-T3			
<u>Configuration&gt;Applications&gt;Bridge&gt;Static MAC Table</u>			
	Address		Received Bridge Port
+			+
	00-00-12-34-54-55		E3
	00-00-44-44-44-44		ETH
	00-12-23-23-23-23		ETH
+			+
ESC-prev menu; !-main menu; &-exit; ?-help			

*Figure 4-13. Static MAC Table*

2. In the Static MAC Table, press <A> to add a static MAC address.

The Static MAC table switches to the Add mode as illustrated in *Figure 4-14*.

RICi-E3, RICi-T3	
<u>Configuration&gt;Applications&gt;Bridge&gt;Static MAC Table</u>	
1. MAC Address	... (000000000000)
2. Receive Bridge Port	> (UNDEFINED)
3. Save	
>	
ESC-prev menu; !-main menu; &-exit; 1 user(s)	

*Figure 4-14. Static MAC Table, Add Mode*

3. In Add mode, perform the following:

- Select **MAC Address**, and enter a new MAC address.
- Select **Receive Bridge Port**, and choose a RICi-E3, RICi-T3 interface this MAC address will be attached to.
- Select **Save All** to save the MAC address.
- Press <Esc> to return to the Static MAC table.

► **To remove a static address from the table:**

- From the Static MAC Table, select the desired MAC address, and then press <R>.

The selected MAC address is deleted from the table.



➤ **To clear the MAC table:**

1. In the Static MAC Table, press <X>.
 

RICi-E3, RICi-T3 displays the following message: **Are you sure (Y/N)?**
2. Press <Y> to confirm your request.

## Configuring the Bridge Port

➤ **To configure the bridge port:**

1. From the Bridge menu, select **Bridge Port**.

The Bridge Port menu appears as illustrated in *Figure 4-15*.

```

                                RICi-E3, RICi-T3

Configuration>Applications>Bridge>Bridge Port (user)

1. Vlan Tag Stacking                (Disable)
2. Port VID/Stacking VID [1 - 4094] (1)
3. Copy Origin Priority              (Disable)
4. Default Priority [0 - 7]         (0)
>
ESC-prev menu; !-main menu; &-exit;          1 user(s)

```

*Figure 4-15. Bridge Port Menu*

2. From the Bridge Port menu, configure the following:
  - **VLAN Tag Stacking**
    - **Enabled** – Double VLAN tagging at ingress is enabled
    - **Disabled** – Double VLAN tagging at ingress is disabled
  - **PVID**. To be assigned to frames that do not contain a VLAN ID
  - **Copy Origin Priority**
    - **Enabled** – Copying priority is enabled
    - **Disabled** – Copying priority is disabled
  - **Default Priority**. Specifies a default priority value to be assigned if no other priority value is explicitly assigned
    - **0 - 7**
3. Select **Save** to complete the bridge port configuration.

## Configuring the QoS Priorities

RICi-E3, RICi-T3 supports three different traffic queues. These traffic queues can be assigned to different priority levels, according to the level of service represented by each queue. There are eight priority levels (0 – 7).

► **To assign the traffic queues to priority levels:**

1. Navigate to Main Menu > Configuration > Application > **QoS**

The QoS menu appears as illustrated in *Figure 4-16*.

```

                                RICi-E3, RICi-T3
Configuration>Applications>QoS
1. User Priority 0 > <Traffic Class 2>
2. User Priority 1 > <Traffic Class 2>
3. User Priority 2 > <Traffic Class 1>
4. User Priority 3 > <Traffic Class 1>
5. User Priority 4 > <Traffic Class 1>
6. User Priority 5 > <Traffic Class 0>
7. User Priority 6 > <Traffic Class 0>
8. User Priority 7 > <Traffic Class 0>
>
'0' is the Highest Traffic Class
ESC-prev menu; !-main menu; &-exit;          1 user(s)

```

*Figure 4-16. QoS Menu*

2. From the QoS menu, select the desired priority (0 – 7) and enter the assigned traffic queue number (0 – 2). Each traffic queue can be assigned to more than one priority.
3. Repeat the previous steps for all priorities.
4. Select **Save**.

## 4.3 Additional Tasks

This section describes additional operations available supported by the RICi-E3, RICi-T3 management software, including the following:

- Displaying inventory
- Displaying RICi-E3, RICi-T3 status at the system, physical and application levels
- Changing user name and password
- Transferring software and configuration files
- Resetting RICi-E3, RICi-T3.

### Displaying the Inventory

The Inventory screen displays a description of the unit, its hardware revision and the power supply type.

➤ **To display the inventory:**

- From the Main menu, select **Inventory**.

Hardware and software appears listed as illustrated in *Figure 4-17*.

- To navigate in the inventory list, use the arrow keys.

RICi-E3, RICi-T3					
<u>Inventory</u>					
ID	Description	Vendor type	Class	Entity name	HWRev
1	RAD.	RICi-T3.chassis	0	RICi-T3.Chassis	0.0
2	RAD.	RICi-T3.PS	0	RICi-T3.Power Supply	
->>					
ESC-prev menu; !-main menu; &-exit; ?-help				1 user(s)	

*Figure 4-17. Inventory Screen*

### Displaying the Status

RICi-E3, RICi-T3 provides access to the following status information:

- **System Level** – MAC address, connection status
- **Physical Level** – Ethernet status
- **Application Level** – MAC table.

The status information is available via the Monitoring menu.

- To access the Monitoring menu:
  - From the Main menu, select **Monitoring**.

The Monitoring menu appears as illustrated in *Figure 4-18*.

```

                                RICi-E3, RICi-T3
Monitoring
1. System                        >
2. Physical Ports              >
3. Applications               >
>
ESC-prev menu; !-main menu; &-exit;          1 user(s)

```

*Figure 4-18. Monitoring Menu*

## Displaying System Status Information

System menu specifies MAC address of the RICi-E3, RICi-T3 unit and provides access to the information on the interface connection status. For description of RICi-E3, RICi-T3 system messages, which are displayed via the Log File screen, refer to *Chapter 5*.

- To display interface connection information:
  1. Navigate to Main Menu > Monitoring > System > **Connection Status**.

The Connection Status screen appears as illustrated in *Figure 4-19* for E3 and *Figure 4-20* for T3 respectively.

```

                                RICi-E3
Monitoring>System>Connection Status

```

Index	Description	Type	Status	Operation	Speed
1	ETHERNET PORT	Fast Eth copper	Up	Up	100000000
2	E3 PORT	DS3	Up	Up	34368000

```

r - Refresh Table
ESC-prev menu; !-main menu; &-exit; ?-help

```

*Figure 4-19. E3 Connection Status Screen*

The Connection Status screen includes the following information:

- **Description** – ETH (User) or E3/T3 (Network) interfaces
- **Type** – type of the interface according to the INF TYPE MIB
- **Status** – administrative status of the link (Up or Down), as set via the Ethernet as illustrated in *Figure 4-9*, and E3/T3 as illustrated in *Figure 4-10* and *Figure 4-11* respectively.
- **Operation** – current operational status of the link (Up or Down).

RICi-T3					
<u>Monitoring&gt;System&gt;Connection Status</u>					
Index	Description	Type	Status	Operation	Speed
1	ETHERNET PORT	Fast Eth copper	Up	Up	100000000
2	T3 PORT	DS3E3	Up	Up	44736000
r - Refresh Table					
ESC-prev menu; !-main menu; &-exit; ?-help					

Figure 4-20. T3 Connection Status Screen

## Displaying the Physical Port Status

You can view the status of the RICi-E3, RICi-T3 physical port connections. For a description of the RICi-E3, RICi-T3 Ethernet and E3/T3 ports statistics, refer to [Chapter 5](#).

### ► To display the Ethernet port status:

1. From the Monitoring menu, select **Physical Port**.

The Physical Port menu appears as illustrated in [Figure 4-21](#).

RICi-T3	
<u>Monitoring&gt;Physical Port</u>	
1. Ethernet Status	>
2. Ethernet Statistics	>
3. T3 Status	>
4. T3 Statistics	>
5. T3 PM	>
>	
ESC-prev menu; !-main menu; &-exit;	1 user(s)

Figure 4-21. T3 Monitoring Physical Port Menu

2. From the Physical Port menu, select **Ethernet Status**.

The Ethernet Status screen appears as illustrated in [Figure 4-22](#).

RICi-E3, RICi-T3	
<u>Monitoring&gt;Physical Layer&gt;Ethernet Status</u>	
Administrative Status	(Up)
Operational Status	(Up)
Actual Speed & Duplex	(100base - FX Full Duplex)
Actual Flow Control	(Disable)
>	
ESC-prev menu; !-main menu; &-exit;	1 user(s)

Figure 4-22. Ethernet Status Screen

The Ethernet Status screen includes the following information:

- **Administrative Status** – administrative status of the link (Up or Down), as specified via the Ethernet menu (*Figure 4-9*).
- **Operational Status** – current operational status of the link (Up or Down)
- **Actual Speed & Duplex** – current data rate and duplex mode of the link
- **Actual Flow Control** – enabled or disabled

The status and statistics features and menus are detailed in *Chapter 6*.

## Displaying the Application Level Status

At the application level RICi-E3, RICi-T3 provides information on the MAC addresses (static and learned) and their bridge port assignments.

### ► To display the MAC table:

1. From the Monitoring menu, select **Application**.

The Application menu appears.

2. From the Application menu, select **MAC Table**.

The MAC Table screen appears as illustrated in *Figure 4-23*.

RICi-E3, RICi-T3			
Monitoring>Application>MAC Table			
+	+	+	+
Address	Type	Port	
+	+	+	+
00-00-12-34-54-55	static	DS3	
00-00-44-44-44-44	learned	DS3	
00-12-23-23-23-23	static	ETHERNET	
+	+	+	+

r=Refresh Table  
ESC-prev menu; !-main menu; &-exit; ?-help

*Figure 4-23. MAC Table*

The MAC Table screen includes the following information:

- **MAC Address** – existing MAC address
- **Type** – static or learned
- **Bridge Port** – Ethernet or DB3 E3

## Changing User Name and Password

From the User Access menu you can change current user name and password. RICI-E3, RICI-T3 supports two user names and password, meaning that no additional user names can be defined. The unit ships with the following default user names and password:

- **User names**
  - **su** – Super user with read/write permissions
  - **user** – Guest with read-only permissions.
- **Password**
  - **1234** – This password applies to both users.

➤ To change the current user name and password:

**Note** *Only superusers (**su**) are able to change user names and passwords.*

1. From the Management Access menu, choose **User Access**.

The User Access menu appears as illustrated in *Figure 4-24*.

RICi-E3, RICi-T3	
<u>Configuration&gt;System&gt;Management&gt;Management Access&gt;User Access</u>	
User Level	(User)
1. User Name	... (user)
2. Old Password	... ()
3. New Password	... ()
4. Confirm New Password ... ()	
>	
f - Forward	
ESC-prev menu; !-main menu; &-exit	1 user(s)

*Figure 4-24. User Access Menu*

2. If desired, press <F> to toggle to the desired other user level (**su** or **user** respectively).
3. From the User Access menu, select **User Name**, and enter a new user name (case-sensitive).
4. Select **Old Password**, and enter the current password
5. Select **New Password**, and assign a new password to the new or existing user name.
6. Select **Confirm New Password**, and enter the new password again to confirm your choice.
7. Select **Save**.

## Transferring Software and Configuration Files

This section instructs you on installing new software releases on RICI-E3, RICI-T3 units and transferring configuration files.

RICi-E3, RICi-T3 stores two software versions, each of them in one of the two partitions of its flash memory, which also contains a boot program. The software is stored in compressed format. The active version is decompressed and loaded into the RICi-E3, RICi-T3 RAM upon power-up. The passive software is kept for backup purposes. If the active software becomes corrupted, you can swap it with the backup. By default, RICi-E3, RICi-T3 ships active software only.

New software releases are distributed as image files (\*.img) downloaded to RICi-E3, RICi-T3. Once downloading starts, the current backup is erased and the new software release is placed in the backup partition instead. When downloading is completed, the unit checks the integrity of the new software file. If approved, the new software release becomes active and the previously active software becomes the backup. If a failure occurs while downloading, the new version is erased and only the previous version remains on the flash memory.

Configuration files can be uploaded for storage and backup.

Management software allows file transfer via TFTP only. You may also download the software files to RICi-E3, RICi-T3 using the Boot Manager, using XMODEM or TFTP, as explained in [Appendix B](#).

► **To transfer files via TFTP:**

1. From the Main menu, select **Utilities**.

The Utilities menu appears.

2. From the Utilities menu, select **File Transfer**.

The File Transfer menu appears as illustrated in [Figure 4-25](#).

RICi-E3, RICi-T3	
<u>Utilities&gt;File Transfer</u>	
1. Server IP Address	... (0.0.0.0)
2. Remote File Name	... ()
3. File Type	(IMG)
4. Command	>
>	
ESC-prev menu; !-main menu; &-exit; 1 user(s)	

Figure 4-25. File Transfer



3. From the File Transfer menu, perform the following:
  - Select **Server IP Address**, and enter the IP address of the TFTP server.
  - Select **Remote File Name**, and enter a file name as explained below.
    - For downloading, assign a name to the file, which is to be downloaded to RICi-E3, RICi-T3.
    - For uploading, specify a name, under which the file is going to be saved on the remote server.
  - Select **File Type**, and choose whether you intend to transfer a software (**IMG**) or configuration (**Configuration**) file.
  - Select **Save** to save the changes.
  - Select **Command** to start the desired procedure:
    - **Upload** – saving a software or configuration file on a remote server.
    - **Download** – transferring a software or configuration file to RICi-E3, RICi-T3.

RICi-E3, RICi-T3 starts file transfer.

The TFTP file transfer process is logged by the following system messages, which are stored in the log file. For additional information, refer to [Chapter 5](#):

- TFTP – Starting Upload
- TFTP – Starting Download
- TFTP – Upload Failed
- TFTP – Download Failed.

## Resetting RICi-E3, RICi-T3

RICi-E3, RICi-T3 supports two types of reset:

- Reset to the default setting
- Overall reset of the device.

### Resetting to the Default

You can reset RICi-E3, RICi-T3 to the factory default settings.

➤ **To reset to the default settings:**

1. From the System menu, select **Set Factory Defaults**.

You are asked to confirm your request:

The device will restart. Do you want to proceed? (Y/N)

2. Press <Y> to confirm your request.

RICi-E3, RICi-T3 resets all parameters to their default settings.

### Resetting the Unit

You can perform an overall reset of RICi-E3, RICi-T3.

➤ **To reset RICi-E3, RICi-T3:**

1. From the System menu, select **Reset Device**.

You are asked to confirm your request:

The device will restart. Do you want to proceed? (Y/N)

2. Press <Y> to confirm your request.

RICi-E3, RICi-T3 resets, preserving the last-saved settings.

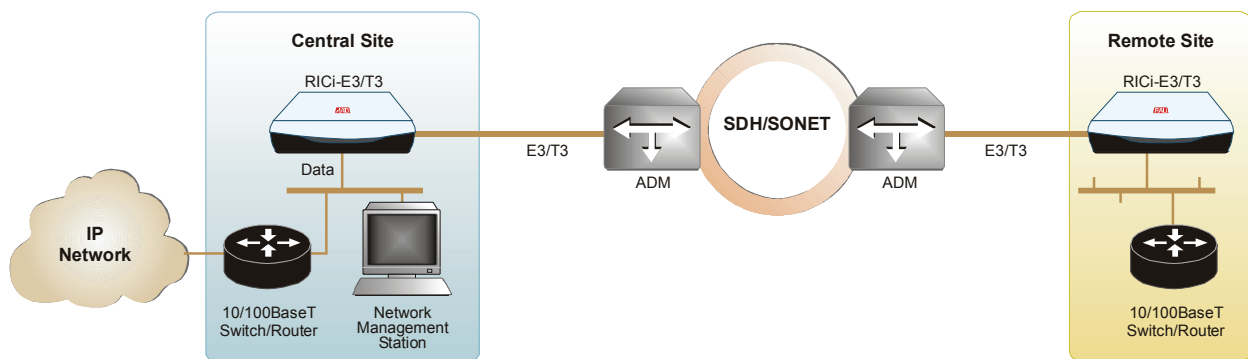
# Chapter 5

## Configuring a Typical Application

This chapter gives detailed instructions for configuring RICi-E3, RICi-T3 for a typical application.

### 5.1 Application Requirements

*Figure 5-1* illustrates a typical application, where a RICi-E3, RICi-T3 unit provides a demarcation point between the carrier and customer networks.



*Figure 5-1. Typical RICi-E3, RICi-T3 Application*

In order to operate to operate RICi-E3, RICi-T3, the central site has to comply with the following requirements:

- User 10/100 Base T connection to a switch or router switching to the IP network
- E3/T3 link to the SONET/SDH network
- Network Management Station for management via SNMP.

You configure the RICi-E3, RICi-T3 using an ASCII terminal connection. The configuration procedure consists of four main stages:

- Defining system parameters
- Configuring physical port parameters (10/100 BaseT and E3 or T3)
- Configuring the bridge
- Assigning QoS levels to the priority queues.

---

## 5.2 Connecting the Cables

### Connecting the Ethernet Port

- To connect the Ethernet interface:
  - Connect the user LAN to the RJ-45 connector designated **10/100 BaseT**.

### Connecting the E3 or T3 Port

- To connect the E3 or T3 interface:
  1. Connect the Rx cable to the BNC designated **Rx**.
  2. Connect the Tx cable to the BNC designated **Tx**

### Connecting the Power

RICi-E3, RICi-T3 accept either 110-240 VAC or 48/60 VDC power through the same power inlet.



Before connecting or disconnecting any cable, the protective earth terminals of this unit must be connected to the protective ground conductor of the mains (AC or DC) power cord. If you are using an extension cord (power cable) make sure it is grounded as well.

Any interruption of the protective (grounding) conductor (inside or outside the instrument) or disconnecting of the protective earth terminal can make this unit dangerous. Intentional interruption is prohibited.

---

#### Connecting AC Power

AC power is supplied to the RICi-E3, RICi-T3 modem through a standard 3-prong connector.

AC power should be supplied via a 1.5m (5 ft) standard power cable terminated by a standard 3-prong connector. A cable is provided with the unit.

- To connect AC power:
  1. Connect the power cable to the power connector on the RICi-E3, RICi-T3 rear panel.
  2. Connect the power cable to the mains outlet.

The unit will be turned on automatically upon connection to the mains.

## Connecting DC Power

A special IEC 60320 adapter for -48/-60 VDC power supply is available. 24 VDC RICi-E3, RICi-T3 units have a terminal block DC inlet and adapter supplied with the unit.

► **To connect DC power:**

Refer to the DC power supply connection supplement for instructions how to wire the DC adapters, and to the *Handling Energized Products* section.

---

## 5.3 Configuring the RICi-E3, RICi-T3 System Parameters

Make sure that the RICi-E3, RICi-T3 unit is properly installed and connected to an ASCII terminal.

### Configuring Parameters via ASCII Terminal

► **To configure the RICi-E3, RICi-T3 system parameters:**

1. Configure an ASCII terminal as follows:
  - Baud rate: 115200 bps
  - one start bit, eight data bits, no parity, one stop bit, no flow control, and VT100 emulation.
2. Connect the terminal to the CONTROL port at the rear panel.
3. Press <Enter> to initiate the control session and then enter the user name and password. The default user name and password for the superuser are as follows:
  - **User Name:** su (lower case)
  - **Password:** 1234
4. Configure the system parameters necessary:  
**Main Menu > Configuration > System > Management > Host IP**
  - **Host IP Address:** Define the host IP address 123.123.123.123
  - **Host IP Mask:** 255.255.255.0
  - **Default Gateway:** 123.123.321.321

---

## 5.4 Configuring the Physical Ports

Configure the following physical ports:

- E3 or T3 port
- Ethernet port

### Configuring the E3 Port

► To configure the E3 port parameters:

1. Navigate to the E3 menu:  
**Main Menu > Configuration > Physical Ports > E3**
2. Configure the E3 parameter values as specified below:
  - **Administrative Status:** Up
  - **Tx Clock:** LBT
  - **Protocol:** HLDC
3. Select **Save**.

### Configuring the T3 Port

► To configure the T3 port parameters:

1. Navigate to the T3 menu:  
**Main Menu > Configuration > Physical Ports > T3**
2. Configure the T3 parameters as specified below:
  - **Administrative Status:** Up
  - **Framing:** M23
  - **Tx Clock:** LBT
  - **Line Build Out:** 0 to 255 ft
  - **Protocol:** HLDC
3. Select **Save**.

## Configuring the Ethernet Port

- To configure the Ethernet port parameters:
  1. Navigate to the Ethernet menu:  
**Main Menu > Configuration > Physical Ports > Ethernet**
  2. Configure the Ethernet parameters as specified below:
    - **Administrative Status:** Up
    - **Autonegotiation:** Enable
    - **Flow Control:** Enable
    - **Max Capability Advertised:** 100BaseTx.
  3. Select **Save**.

## Configuring the Bridge Parameters

- To configure the bridge parameters:
  1. Navigate to the Bridge menu:  
**Main Menu > Configuration > Applications > Bridge**
  2. Configure the Bridge parameter values as specified below:
    - **Forwarding Mode:** Transparent
    - **Aging Time:** 300.
  3. Select **Save**.

## Building the MAC Table

- To configure the static MAC table:
  1. Navigate to the Static MAC Table menu:  
**Main Menu > Configuration > Applications > Bridge > Static MAC table**
  2. Press <A> to add a static MAC address.  
The Static MAC Table display changes, entering the Add mode.
  3. In Add mode, perform the following:
    - Select **MAC Address**, and enter a new MAC address.
    - Select **Receive Bridge Port**, and choose a RICI-E3, RICI-T3 interface this MAC address will be attached to.
    - Select **Save** to save the MAC address.
    - Press <Esc> to return to the Static MAC Table.

## Configuring the Bridge Port

- To configure the bridge port:
  1. Navigate to the Bridge Port menu:  
**Main Menu > Configuration > Applications > Bridge > Bridge Port**
  2. Configure the Bridge Port parameter values:
    - **VLAN Tag Stacking**
    - **PVID**
    - **Copy Origin Priority**
    - **Default Priority.**
  3. Select **Save**.

## Configuring the QoS Priorities

The seven QoS levels must be assigned to three priority queues.

- To assign the traffic queues to priority levels:
  1. Navigate to the QoS menu:  
**Main Menu > Configuration > Applications > QoS (User Priority)**
  2. For each priority, select the desired priority (0 – 7) and type the assigned traffic queue number (0 – 2). Each traffic queue can be assigned to more than one priority.

The RICi-E3, RICi-T3 unit is now ready for operation.



# Chapter 6

## Diagnostics and Troubleshooting

This chapter describes how to perform the following tasks:

- Monitor the RICi-E3, RICi-T3 performance
- Display statistics
- Perform connectivity tests.

### 6.1 Monitoring Performance

#### Interface Statistics

You can display statistic data for the both the Ethernet and E3/T3 ports.

► To view the Ethernet statistics:

1. From the Monitoring menu, select **Physical Port**.

The Physical Port menu appears.

2. From the Physical Port menu, select **Ethernet Statistics**.

The Ethernet Statistics screen appears as illustrated in *Figure 6-1*.

3. Press <C> to reset the counters or <R> to refresh the screen.

```
RICi-E3, RICi-T3

Monitoring>Physical Port>Ethernet Statistics

Rx Correct Frames          (0)
Rx Correct Octets          (0)
Rx FCS Errors              (0)
Tx Correct Frames          (0)
Tx Correct Octets          (0)
Tx Collision                (0)
  c - Clear Statistics      r - Refresh Statistics
>
ESC-prev.menu; !-main menu; &-exit;          1 user(s)
```

*Figure 6-1. Ethernet Statistics*

Table 6-1. Ethernet Statistics Parameters

Parameter	Description
Rx Correct Frames	The total number of correct frames received
Rx Correct Octets	The total number of octets (bytes) received
Rx Alignment Error	Total number of frames received with a valid length, but with invalid FCS and a non-integral number of octets
Tx Correct Frames	The number of frames successfully transmitted
Tx Correct Octets	The number of octets successfully transmitted
Tx Collision	Total number of transmission attempts that experienced a collision

► To view the E3 statistics:

1. From the Monitoring menu, select **Physical Port**.

The Physical Port menu appears.

2. From the Physical Port menu, select **E3 Statistics**.

The E3 Statistics screen appears as illustrated in *Figure 6-2*.

3. Press <C> to reset the counters or <R> to refresh the screen.

```

                                RICi-E3

Monitoring>Physical Port>E3 Statistics
Rx Total Frames                (0)
Rx Total Octets                (0)
Rx Total Errors                (0)
Tx Total Frames                (0)
Tx Total Octets                (0)
Tx Total Errors                (0)
Tx Congestion Dropped Frames  (0)

c - Clear Statistics    r - Refresh Statistics
>
ESC-prev.menu; !-main menu; &-exit;          1 user(s)

```

Figure 6-2. E3 Statistics

Table 6-2. E3 Statistics Parameters

Parameter	Description
Rx Total Frames	The total number of frames received.
Rx Total Octets	The total number of octets (bytes) received
Rx Total Errors	The total number of errors received
Tx Total Frames	The total number of frames transmitted.
Tx Total Octets	The total number of octets (bytes) transmitted
Tx Total Errors	The total number of errors transmitted
Tx Congestion Dropped Frames	Total number of frames that are discarded due to a lack of buffer space

➤ To view the T3 statistics:

1. From the Monitoring menu, select **Physical Port**.

The Physical Port menu appears.

2. From the Physical Port menu, select **T3 Statistics**.

The T3 Statistics screen appears as illustrated in *Figure 6-3*.

3. Press <C> to reset the counters or <R> to refresh the screen.

```

                                RICI-T3
Monitoring>Physical Port>T3 Statistics
Rx Total Frames                      (0)
Rx Total Octets                      (0)
Rx Total Errors                      (0)
Tx Total Frames                      (0)
Tx Total Octets                      (0)
Tx Total Errors                      (0)
Tx Congestion Dropped Frames        (0)

c - Clear Statistics      r - Refresh Statistics
>
ESC-prev.menu; !-main menu; &-exit;
1 user(s)

```

Figure 6-3. T3 Statistics

Table 6-3. T3 Statistics Parameters

Parameter	Description
Rx Total Frames	The total number of frames received.
Rx Total Octets	The total number of octets (bytes) received
Rx Total Errors	The total number of errors received
Tx Total Frames	The total number of frames transmitted.
Tx Total Octets	The total number of octets (bytes) transmitted
Tx Total Errors	The total number of errors transmitted
Tx Congestion Dropped Frames	Total number of frames that are discarded due to a lack of buffer space

## Displaying System Messages

RICi-E3, RICi-T3 maintains a log file, which can hold up to 100 system messages. All events are time-stamped.

► **To access the event log:**

1. From the System menu, select **Log File**.

The Log File screen appears as illustrated in [Figure 6-4](#).

2. In the Log File screen, use the Up and Down keys to scroll the alarm list up and down.

RICi-E3, RICi-T3			
<b>Monitoring&gt;System&gt;Log File</b>			
Code	Description	Severity	Time
10	LINK_UP: T3 Port	Major	0:00:00
10	LINK_UP: Ethernet Port	Major	0:00:00
40	SNMP_AUTH_FAIL: By address 100.50.24.94	Event	3:57:39
20	LINK_DOWN: T3 Port	Major	21:20:45
20	LINK_DOWN: ETH Port	Major	0:0:0
>			
x - Clear Log File      r - Refresh Table			
ESC-prev.menu; !-main menu; &-exit; ?-help			1 user(s)

Figure 6-4. Log File

---

---

## 6.2 Handling Alarms

Alarms are viewed in the log file.

### Viewing Alarms

*Table 6-4* lists the event types that appear in the log file. The Log File screen is accessible from the System menu:

Main Menu > Monitoring > System > **Log File**

*Table 6-4. Event List*

Code	Event	Description
10	LINK_UP	Network Ethernet port has been connected
20	LINK_DOWN	Network Ethernet port has been disconnected
30	HW_FAILURE	Hardware failure has been detected
40	SNMP_AUTH_FAIL	SNMP Authentication Failure trap has been received
50	WEB_START	ConfiguRAD session has been initiated
51	WEB_FINISH	ConfiguRAD session has been finished
52	WEB_FAILURE	ConfiguRAD session has failed
60	TELNET_START	Telnet session has been initiated
61	TELNET_FINISH	Telnet session has been finished
62	TELNET_FAILURE	Telnet session has failed
70	TFTP_START	TFTP session has been initiated
71	TFTP_FINISH	TFTP session has been finished
72	TFTP_FAILURE	TFTP session has failed

### Clearing Log File

- To clear the log file:
  - In the Log File screen, press <X>.

## 6.3 Troubleshooting

Table 6-5. Troubleshooting

Trouble Symptoms	Possible Cause	Recommended Course of Action
All front panel indicators are OFF	The unit is not receiving power	Check that power is supplied to the unit.
LOS indicator is Red	External problem	Check the E3/T3 cable.
LOS indicator is Yellow	External problem	Check the T3 cable.
ETH LINK indicator is Off	Problem with LAN cable or hub	Check LAN cable and hub.
Physical connection Ok, but no IP connection	IP configuration problem	Check for errors in the routing table, the host IP addresses or the default gateway.
ALM indicator is Red	Alarm detected	View the alarm under Main Menu > Configuration > Monitoring > Log File.

## 6.4 Connectivity Tests

RICi-E3, RICi-T3 checks network integrity by running ping, trace route, or loopback tests.

### Running Ping Test

You can ping remote IP host to check the RICi-E3, RICi-T3 IP connectivity. Activating the Ping test sends ping frames to the IP host to indicate the availability of the connection at IP level. When the terminal receives continuous responses from the IP host, the IP connection is up.

#### ► To ping an IP host:

1. Navigate to Main menu > Diagnostics > **Ping**.  
The Ping menu appears as illustrated in *Figure 6-5*.
2. In the Ping menu, configure the following:
  - **Destination IP Address** (IP address of the host that you intend to ping): 0.0.0.0 to 255.255.255.255.
  - **Number of frames to send**: 0-50.  
To send a continuous stream of frames, select 0.
3. Select **Send Ping** to start sending pings.
4. Select **Stop Ping** to stop the ping test.

```
RICi-E3, RICi-T3

Diagnostics>Ping

1. Destination IP Address      ... (0.0.0.0)
2. Number of Frames to Send [0 - 50] ... (0)
3. Send Ping
4. Stop Ping

>
0 means send frames continuously
ESC-prev.menu; !-main menu; &-exit;          1 user(s)
```

Figure 6-5. Ping Menu

## Tracing the Route

This diagnostic utility traces the route through the network from RICi-E3, RICi-T3 to the destination host.

► To trace a route:

1. From the Diagnostics menu, select **Trace Route**.

The Trace Route menu appears as illustrated in [Figure 6-6](#).

2. From the Trace Route menu, select **Destination IP Address** and enter an IP address of the host to which you intend to trace route.
3. Select **Display Trace Route** to start tracing.

RICi-E3, RICi-T3 starts tracing the route, displaying the IP addresses of all hop nodes.

4. Select **Stop Trace Route** to stop the tracing.

```
RICi-E3, RICi-T3

Diagnostics> Trace Route

1. Destination IP Address      ... (0.0.0.0)
2. Display Trace Route
3. Stop Trace Route

>

ESC-prev.menu; !-main menu; &-exit;          1 user(s)
```

Figure 6-6. Trace Route Menu

## Loopback Test

This diagnostic utility executes either a remote or local loopback test. The purpose of these loopback tests is to determine the source of a break in the data flow.

► **To execute a loopback test:**

1. From the Diagnostics menu, select **Loopback**.

The Loopback menu appears as illustrated in *Figure 6-7*.

2. From the Loopback menu, select **Loopback State**.
  - **Remote:** perform remote loopback
  - **Local:** perform local loop
  - **Disable:** disable loopback testing.
3. Set the Loopback timeout in seconds to a value between 0 and 3600.

**Note**

*0 means loopback forever!*

```

                                RICi-E3, RICi-T3

Diagnostics> Loopback

1. T3 Loopback state                ...> (Disable)
2. Loopback TimeOut (sec) [0 - 3600]... (0)
>

ESC-prev.menu; !-main menu; &-exit;          1 user(s)

```

*Figure 6-7. Loopback Menu*



## 6.5 Testing the Cables

You may check the quality of the copper cables, connectors and terminations by running a Virtual Cable Test (VCT). During the test RICI-E3, RICI-T3 transmits a signal of known amplitude (+1V) over each pair of an attached cable, testing the RX and TX pairs sequentially. The signal travels over the cable until it is reflected by a cable error. By measuring the magnitude of the reflection and the time it takes for the reflection to return, RICI-E3, RICI-T3 estimates an approximate distance to the location of physical damage or a short circuit.

► **To run the VCT:**

1. From the Diagnostics menu, select **VCT Test**.

The VCT Test menu appears as illustrated in *Figure 6-8*.

2. In the VCT Test menu, press <F> to select the RICI-E3, RICI-T3 user port associated with the cable that you intend to test.
3. From the VCT Test menu, select **Start Test** to initiate the VCT on the selected port.

The VCT results appear for the receive and transmit wires as listed below:

- **Tx/Rx Test Result:**
  - **Fail** – The test failed, no results have been achieved
  - **Normal** – No cable errors have been detected
  - **Open** – Physical damage has been detected
  - **Short** – A short circuit has been detected.
- **Rx/Tx distance of reflection:** Approximate distance to the location of physical damage or short circuit in meters.

```

                                RICI-E3, RICI-T3
Diagnostics>VCT Test

Port Label                      (2)
Port                            (User Port 1)

Tx Test Result                  (Normal)
Tx Distance of Reflection)      (0)
Rx Test Result                  (Normal)
Rx Distance of Reflection)      (0)

1. Start Test

>
F - Forward
ESC-prev.menu; !-main menu; &-exit;          1 user(s)

```

*Figure 6-8. VCT Test Menu*

---

---

## 6.6 Technical Support

Technical support for this product can be obtained from the local distributor from whom it was purchased.

For further information, please contact the [RAD distributor](#) nearest you or one of [RAD's offices](#) worldwide.

# Appendix A

---

## Pinouts

---

### A.1 Ethernet Connector

The **10/100 BaseT** Ethernet electrical interface terminates in an 8-pin RJ-45 connector, wired accordance to [Table A-1](#).

*Table A-1. 10/100 BaseT Ethernet Connector Pinouts*

Pin	Function
1	Tx+
2	Tx-
3	Rx+
4, 5	-
6	Rx-
7, 8	-

---

### A.2 CONTROL Connector

The **Control** terminal interface terminates in a V.24/RS-232 9-pin D-type female DCE connector. [Table A-2](#) lists the **Control** connector pin assignments.

*Table A-2. CONTROL Connector Pinout*

Pin	Function
1	Data Carrier Detect (DCD)
2	Receive Data (RD)
3	Transmit Data (TD)
4	Data Terminal Ready (DTR)
5	Ground (GND)
6	Data Set Ready (DSR)
7	Request to Send (RTS)
8	Clear to Send (CTS)
9	Ring Indication (RI)



# Appendix B

---

## Boot Manager

This appendix provides a description of the RICi-E3, RICi-T3 boot procedure for downloading software using an ASCII terminal.

The RICi-E3, RICi-T3 software is stored on a flash memory in two sections, the boot sector and the file system. The boot sector contains a boot program that calls the program itself from the file system.

The file system can hold two compressed copies of the RICi-E3, RICi-T3 code. One copy is referred to as the operating file, and the other one as the backup file. The operating file is the default-executable RICi-E3, RICi-T3 code. The backup file is used whenever the operating file is absent or corrupted.

---

### B.1 Booting RICi-E3, RICi-T3

RICi-E3, RICi-T3 boots automatically. After powering up, no user intervention is required, except when the user wants to access the file system to modify or update the software or the RICi-E3, RICi-T3 configuration.

### Accessing the Boot Manager

The Boot Manager menu is an option that allows you to perform basic file transfer operations. These operations are all optional.

► **To access the Boot Manager menu:**

- Press <Enter> several times immediately after powering up the RICi-E3, RICi-T3 unit.

The Boot Manager menu appears as illustrated in *Figure B-1*.

```
RAD RICi-E3/T3 Boot Version 1.20 (Jan 25 2005)
Boot Manager Version 7.02 (Jan 25 2005)

0 - Exit Boot-Manager
1 - Dir
2 - Set active software copy
3 - Delete software copy
4 - Download an application by XMODEM
5 - Format flash
6 - Show basic hardware information
7 - Reset board
8 - System configuration.
9 - Download an application by TFTP
Press the ESC key to return to the main menu.
Select:
```

*Figure B-1. Boot Manager Menu*

From the Boot Manager menu, you can perform the following:

- Listing all files stored in the flash memory
- Exchanging the operating and backup files
- Deleting the operating file; the backup file becomes the operating file
- Downloading a new operating file (via XMODEM or TFTP); the previous operating file is saved as the backup file
- Deleting all software and configuration files
- Displaying the basic hardware information (RAM, ROM size etc)
- Resetting the RICi-E3, RICi-T3 board
- Configuring the RICi-E3, RICi-T3 IP address, IP mask and default gateway for the consecutive file download via TFTP.

If you choose to exchange or delete a file, you are prompted to confirm your request.

---

## B.2 Transferring the Software and Configuration Files

New software releases are distributed as separate files, which are downloaded to RICi-E3, RICi-T3 using the XMODEM protocol or TFTP from the Boot Manager menu. You may also download a new software release via TFTP, when the RICi-E3, RICi-T3 management software is already running (**Main menu > Utilities > File Transfer**).

The TFTP protocol can also be used for uploading configuration files that contain the RICi-E3, RICi-T3 database to the management station. Administrators can use this capability to distribute verified configuration files to all other units that use the similar configuration.

### Downloading Application Files via XMODEM

Downloading application files using the XMODEM protocol is performed from the Boot Manager menu.

► **To download application file via XMODEM:**

1. Configure your ASCII terminal or terminal emulation utility running on your PC to A DATA RATE OF 115.2 Kbps.
2. Navigate to the Boot Manager menu.

The Boot Manager menu appears as illustrated in *Figure B-1*.

3. From the Boot Manager menu, select **Download Files or an Application by XMODEM**.

RICi-E3, RICi-T3 displays the following message:  
Select Copy number for download (0)

4. Select the backup partition by typing its number, **0** or **1**.

RICi-E3, RICi-T3 responds with the following string:  
Please start the XMODEM download.

5. Send the software release file to RICi-E3, RICi-T3 using the XMODEM utility of your terminal application.

Once the downloading is completed, RICi-E3, RICi-T3 saves the new release as an active partition, the former active partition turns into backup, and the boot sequence continues normally.

If a failure occurs during the download, the partially downloaded software is erased. In this case, only active software is left in the flash memory.

## Downloading Application Files via TFTP

➤ To download application file via TFTP:

1. From the Boot Manager menu, select **System Configuration**.
2. Configure the IP parameters of RICi-E3, RICi-T3 (IP address, IP mask and default gateway). These parameters are valid only for the TFTP file transfer via the Boot Manager.
3. Start a TFTP application.
4. Configure the TFTP communication parameters as follows:
  - Connection timeout – more than 30 seconds to prevent an automatic disconnection during the backup partition deletion (about 25 seconds).
  - Block size – 512 bytes.
  - UDP port – 69.
5. Select a local software release file to download.
6. Enter the RICi-E3, RICi-T3 IP address.
7. Start downloading.

RICi-E3, RICi-T3 automatically erases the backup partition (it takes about 25 seconds). Once the downloading is completed, RICi-E3, RICi-T3 saves the new release as an active partition; the former active partition turns into backup.



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**RAD**

# SUPPLEMENT

## DC Power Supply Connection – AC/DC Adapter (AD) Plug

*Note: Ignore this supplement if the unit is AC-powered.*

Certain units are equipped with a Wide Range AC/DC power supply. These units are equipped with a standard AC-type 3-prong power input connector located on the unit rear panel. This power input connector can be used for both AC and DC voltage inputs.

For DC operation, a compatible AC/DC Adapter (AD) plug for attaching to your DC power supply lines is used (see Figure 1).

Connect the wires of your DC power supply cable to the AD plug, according to the voltage polarity and assembly instructions provided below.

**Caution:** Prepare all connections to the AD plug **before** inserting it into the unit's power connector.



Figure 1

### Preparing and Connecting the Power Supply Cable with the AD Plug

1. Loosen the cover screw on the bottom of the AD plug to open it (see Figure 2).
2. Run your DC power supply cable through the removable cable guard and through the open cable clamp.
3. Place each DC wire lead into the appropriate AD plug wire terminal according to the voltage polarity mapping shown. Afterwards, tighten the terminal screws close.
4. Fit the cable guard in its slot and then close the clamp over the cable. Tighten the clamp screws to secure the cable.
5. Reassemble the two halves of the AD plug and tighten the cover screw.
6. Connect the assembled power supply cable to the unit.

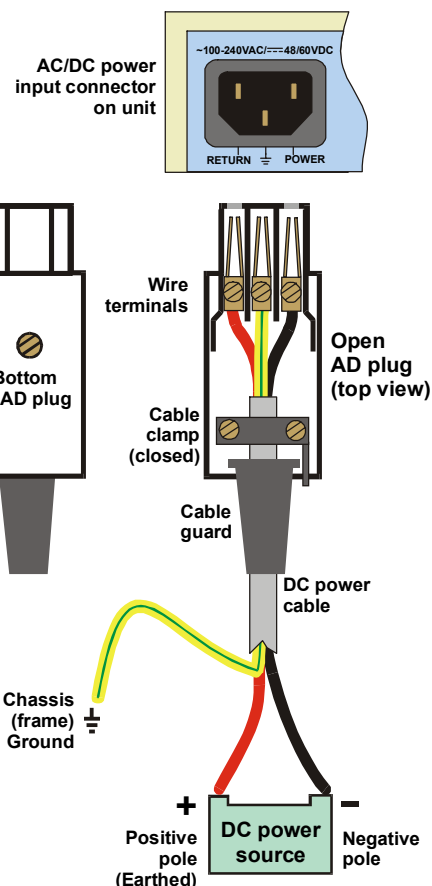


Figure 2



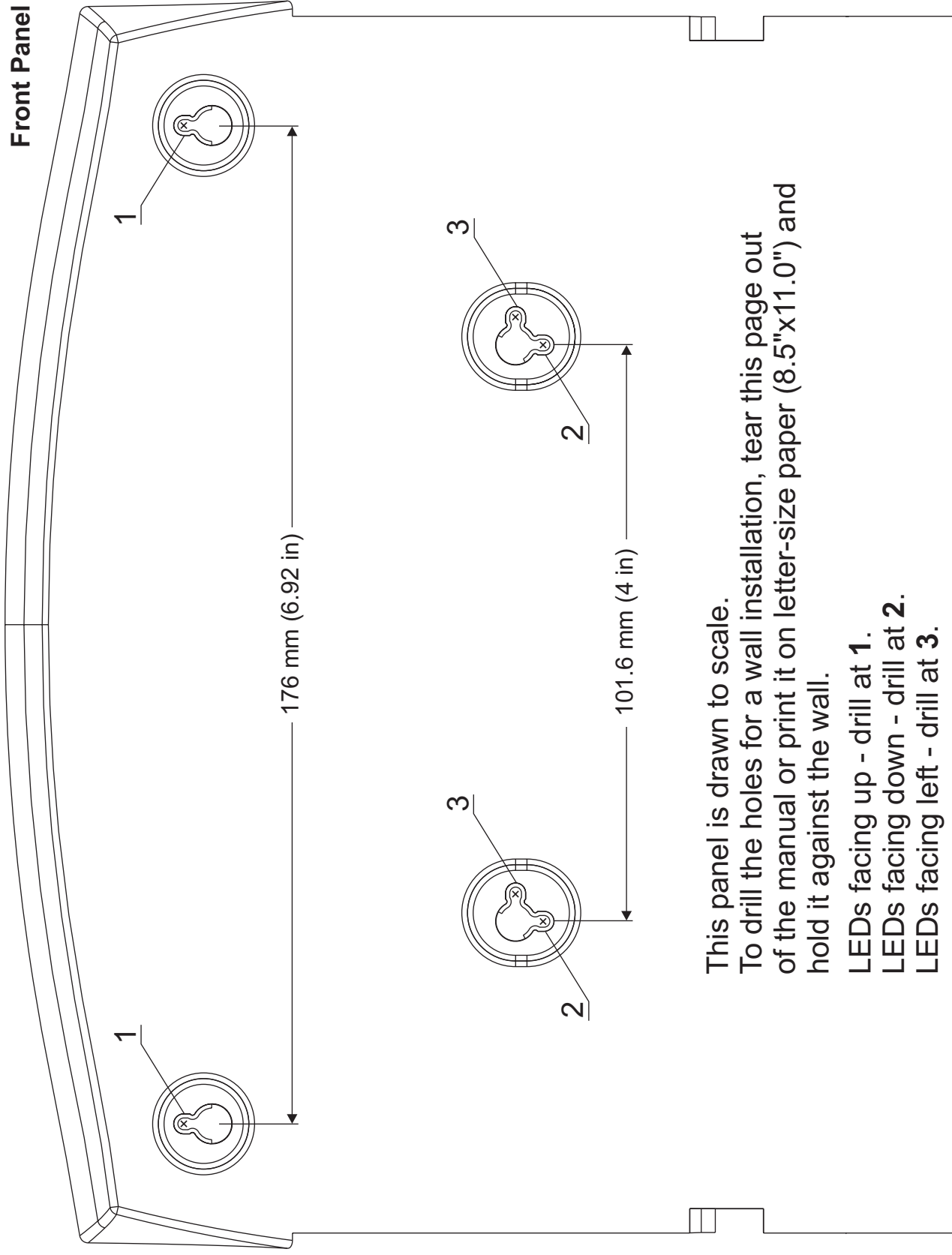
### Warning:

- Reversing the wire voltage polarity will **not** cause damage to the unit, but the internal protection fuse will not function.
- Always connect a ground (earth) wire to the AD plug's Chassis (frame) Ground terminal. Connecting the unit without a protective ground, or interruption of the grounding (for example, by using an extension power cord without a grounding conductor) can cause harm to the unit or to the equipment connected to it!
- The AD adapter is not intended for field wiring.



# Supplement

## Drilling Template for Wall Installation



This panel is drawn to scale.  
To drill the holes for a wall installation, tear this page out of the manual or print it on letter-size paper (8.5"x11.0") and hold it against the wall.  
LEDs facing up - drill at **1**.  
LEDs facing down - drill at **2**.  
LEDs facing left - drill at **3**.







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**Publication Number:** 388-200-08/07

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What did you like about the manual?

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## Error Report

Type of error(s) or problem(s):

- ☐ Incompatibility with product
- ☐ Difficulty in understanding text
- ☐ Regulatory information (Safety, Compliance, Warnings, etc.)
- ☐ Difficulty in finding needed information
- ☐ Missing information
- ☐ Illogical flow of information
- ☐ Style (spelling, grammar, references, etc.)
- ☐ Appearance
- ☐ Other \_\_\_\_\_

Please list the exact page numbers with the error(s), detail the errors you found (information missing, unclear or inadequately explained, etc.) and attach the page to your fax, if necessary.

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Please add any comments or suggestions you may have.

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You are:

- ☐ Distributor
- ☐ End user
- ☐ VAR
- ☐ Other

Who is your distributor?

Your name and company:

Job title:

Address:

Direct telephone number and extension:

Fax number:

E-mail:

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